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CAOUTCHOUC GUTTA-PERCHA

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THE WAR AND THE RUBBER TRADE IN THE UNITED STATES.

FEW industries are less directly connected with the scene of the great conflict now in progress in Europe than the rubber trade in the United States, and yet none has been more quickly or more widely affected. As an illustration of which fact the extraordinary performance of the crude rubber market in the early part of August might be cited. On the first day of August Upriver fine sold at seventy cents. On the seventh day of August it sold at a dollar and twenty cents—an increase in six days of seventy-one per cent. On the same two dates plantation first latex sold at fifty-five cents and a dollar and fifteen cents—an advance in less than a week of one hundred and ten per cent. The rubber market has seen many fluctuations but at no time hitherto has there been any such rapid advance.

The crude rubber market was temporarily almost in a condition of panic and the feeling quickly communicated itself to the manufacturers, a number of whom, seeing the price of their necessary supplies going up with such unprecedented rapidity, announced a material advance in the price of manufactured goods. This was particularly true of the tire market.

The reasoning of the rubber men, both importers and manufacturers, was as follows: With only two or possibly three months' supplies of rubber at the factories; with not more than three or four hundred tons in the hands of importers; with the sea swept clean of commerce; with the channels of receiving rubber effectually stopped and all the avenues of accustomed exchange closed and barred; with contracts to be filled and scant material to fill them with, of what avail was it that the accustomed supply of Amazon rubber was on the docks at Para ready for shipment and an ever increasing supply of plantation rubber waiting at Singapore to embark for American markets? In the state of the trade's mind at that time these southern and eastern supplies might as well have been in the moon. The situation looked desperate.

But after two weeks the feeling of alarm generally subsided. It was discovered that all commerce was not to be driven from the seas and that, barring German boats, the bottoms of other nations, and particularly of all neutral nations, would soon be able to ply their accustomed course. Congress rushed in at once to remove the restrictions that had for years so greatly fettered our merchant marine, and some shipping lines, including those to South America, promised an immediate addition to their number of ships; so that communication with Para appeared likely soon to resume its normal condition and, with the overwhelming advantage of the Allies on the seas, the likelihood of open water from Singapore to Liverpool and New York seemed, if not imminent, at least a probability of the early future.

In addition, it became more obvious with each day of fighting that it would be a long time before the European market could use more than a fraction of the rubber that had hitherto been delivered at its factories—which would mean all the greater supply for the manufacturers of the United States.

When these saner aspects of the situation began to appear prices receded, until during the latter part of August the quotations, both for Para and eastern rubber, had lost over two-thirds of their meteoric rise during the first week of the month. Many manufacturers also concluded that it would be unnecessary for them, at present at least, to demand an advance in their prices, and where their goods had been marked up during the first week of the month in several cases they were marked back again during the third week.

It cannot be said that the present situation is normal, for it is far from it; but it is sane and reasonable. The aspect of panic has been entirely eliminated.

Fortunately, while the United States is absolutely dependent for its crude rubber supplies on foreign parts, in the matter of various compounding ingredients it is to a great extent independent. Some years ago our sulphur came from Italy and Sicily, but for a number of years past we have more than supplied our home needs; and this is also true, in large part, of zinc oxide and lithopone. We also produce more lead compounds than we consume, and while most of our magnesia has hitherto come from the Balkans, we have ample deposits on the Pacific coast which will be available if necessary. Taking all the ingredients used in rubber manufacture, we are dependent to a comparatively slight extent on foreign fields.

It is given to no man to read the future with absolute accuracy, but according to the best conjectures that we can now make—based upon present conditions—the rubber industry of this country need not be particularly apprehensive. To be sure, rubber stocks are low, for there has been a general feeling through the trade for the past year—based on the ever increasing supplies from the East—that the price of crude rubber would gradually go lower; and of course the immediate new supply of crude will be very small. In August, 1913, importations of rubber into the United States amounted to 8,679,222 pounds and, including all kinds—jelutong, balata, etc.—the importations amounted to 11,064,392 pounds; that being just a trifle over the average for the last six months of 1913. During the first twenty-six days of August just past our importations of rubber amounted to only 4,985,500 pounds, and according to the best advices the amount now afloat on its way to New York is still smaller.

But with the clearing of the waters of hostile ships and the great increase in bottoms flying the American flag, the rubber accumulating in South America and in the East will undoubtedly be on its way to these ports before our supplies have been exhausted. For it must be kept in mind that home consumption of rubber manufactured goods is likely in the immediate few weeks to show a falling off. This is particularly true of anything in the way of luxuries. The great conflict, with its terrific destruction of property and with its awful human carnage, cannot but have a sobering effect upon the people of the United States, and they are likely—for the time being, at least—to revert somewhat to the simple life. We cannot expect immediately to increase our exports to Europe, as tires, shoes and clothing are contraband of war. But, passing over the next few weeks, the general effect for the future must be a great increase in the output of our rubber factories. Last year our entire sales of manufactured rubber goods in the European market amounted to $5,201,914, and in South America our total sale of manufactured rubber goods reached only $765,709. Certainly with the inability of Europe for a long time to come to meet its own requirements, and much less to supply those of the foreign trade, our exports of rubber manufactures both to Europe and to the South American continent should increase many hundred per cent.

The rubber trade of the United States should under present circumstances adopt the motto of the Administration, with a single but important change. They should not embark on a period of "watchful waiting," but rather on a period of watchful working, using much caution in their immediate transactions but making all possible preparation for the widening market that is bound to come when the war shall be brought to a close.

THE OPENING DOOR OF SOUTH AMERICAN TRADE.

FOR the past three weeks the daily press—incited to a certain extent by a strong appeal made by Mr. John Barrett, the energetic Director General of the Pan American Union—has been calling on all American manufacturers to seize upon the great prize of South American trade which has been divided for so many years among the various nations of Europe but which now perforce they are in large part compelled to neglect.

This is no new topic for the columns of THE INDIA RUBBER WORLD. Much has appeared in its pages during the last three years on the great desirability of increasing our trade with the southern continent. But those enterprising manufacturers who have knocked at that door have not received a very cordial response. This of course has been largely owing to the fact that behind the door were the English and the Germans, who, as far as they could, kept it closed against all new comers. But now that the English and the Germans have come to blows the door is opening and of necessity will open still wider, for on the South American continent there are sixty million people who hitherto have been largely dependent for their manufactured goods on the factories of Europe, and now that many of these are closed and others working under extreme difficulties, they must look to us for a substantial percentage of their supplies.

The imports of manufactured articles into South America amounted to nearly a billion dollars last year, or, to be more exact, nine hundred and sixty-one millions. Of

this great aggregate importations from Great Britain amounted to two hundred and seventy-three millions and from Germany to one hundred and eighty millions, the two together representing nearly one-half of the South American foreign trade; while the imports from the United States were valued at only one hundred and fifty-five millions, or about one-sixth of the whole.

The obstacles hitherto in the way of extending our trade on the continent to the south of us have been many and almost insurmountable. One difficulty was that the balance of trade was always against us, as the South American exports to this country amounted to two hundred and fifty millions a year, while their imports from us were a hundred million less. A second difficulty was the fact that all trade had to be financed through England or the Continent. But under present conditions, of course these obstacles either have been entirely removed or soon will be. The balance of trade will undoubtedly soon prove to be in our favor, and while the purpose of North American banks—as mentioned in our August issue—to establish branch banks in South American cities has not yet been put into effect, it will be in the immediate future, and in the meantime both New York and Boston banks are establishing an exchange of credits with South American bankers, so that direct financing of both imports and exports between the two American continents will soon be possible.

There should certainly be a great increase in our South American market for manufactured rubber goods. During the last two years we have paid South America about sixty million dollars for ninety million pounds of rubber, and in that time we have sent to South America rubber manufactured goods to the value of probably not over a million and a half—a grotesquely inadequate figure. We can hardly expect that the South American market will ever approach the North American market, for the consumption of manufactured rubber goods in the United States amounts to over two dollars per year per capita, but there ought certainly to be a market in South America for rubber goods to the extent of fifty cents a year per capita, and if that could be accomplished and the United States could get a monopoly of it, it would mean an export business of thirty million dollars a year.

One great difficulty hitherto in selling rubber goods in South America, according to salesmen who have been through the experience, was the fact that whenever samples from the United States were submitted our European friends, and particularly the Germans, would offer to produce the same goods at a considerably less price. Our salesmen have contended that these under-price goods were very much under the quality of the American samples, but as the American goods were effectively kept out of the market the consumer had no means of making a comparison. This obstacle is now removed and American goods have an opportunity of making their superiority known. And if they are superior the consumer will soon discover this fact and be quite unlikely to be tempted in the future to revert to articles of a lower quality because of the offer of a lower price.

At any rate, this great European conflict has given the American manufacturer, without any effort on his part, the opportunity that he has been struggling for so long in vain. The South Americans are bound to give our goods a trial, as for the time being they are compelled to resort to our markets; and if the manufacturers of the United States can adapt themselves to South American conditions, can give their customers as long credits as they have been accustomed to and can supply them with better articles at a price no higher than they have been accustomed to pay, they will not only be able to enter this market but will be able to remain in it permanently.

WAR PRICES WILL START SYNTHESISTS AGAIN.

WITH the price of natural rubber persistently sagging and the apparently well-founded promise of the planters that they would some day supply the market with smoked sheet at a shilling a pound, it is quite natural that the laboratory workers should find their ardor somewhat abated. But conditions during the last few weeks have emphasized a fact which is fairly obvious but likely in normal times to be lost sight of, namely, that it is not enough that the forests of the South and the plantations of the East should be able to produce rubber, but there must in addition be sure and not too expensive means of transportation to the place of manufacture. When the roar of the cannon came thundering out of a clear sky—or if not exactly a clear sky, a sky to all appearances but slightly clouded—driving to shelter all the commerce of the world, the great advantage of producing the raw material in the same country in which it is made into goods became evident at once. If the laboratories could project themselves into the present situation with fifty cent, or even with sixty-five cent rubber, they would not only be able to find a ready market for their products but would lift quite a burden of uncertainty from the minds of the makers of tires and other rubber goods.

THE IMPORTANCE OF THE SOLDIER'S SHOE.

AN unusual competition, interesting at any time but under present conditions of exceptional importance, has just come to a close. A little over a year ago the Quartermaster's Department of the United States Army determined if possible to discover the best footwear human ingenuity could devise for the soldier. The officials invited the manufacturers to submit two pairs of shoes each which should be best adapted to army use. Two hundred and forty-two pairs of shoes were entered in the competition.

In the opinion of military experts, the most important article of a soldier's equipment, next to his gun, is his shoes—a fact which it needs no particular argument to prove. The greatest pains were taken to ascertain the proper requirements of a marching shoe. Innumerable X-ray photographs were taken of the anatomy of the foot before, during and after marching, and after months of scientific and most painstaking investigation the award for the best army shoe was made and contracts were given two manufacturers whose shoes offered in competition appeared best to comply with the stipulations. As a result of this thoroughgoing method it is asserted with great confidence by the experts of the Quartermaster's Department that the soldiers of the United States Army will be the best shod in the world.

This matter is of interest to the rubber trade, as rubber footwear will naturally follow the lines prescribed for leather footwear. As a matter of fact, the government on giving a contract either to the manufacturer of leather footwear or the manufacturer of rubber footwear supplies its own lasts, so that whether the footwear is leather or rubber it necessarily follows the lines which the government requires. The contracts for rubber footwear for army use are of course small as compared with those that go to the makers of leather shoes, but still they are large enough to be of interest to the rubber footwear manufacturers. In normal times the standing army requires each year about seventeen thousand pairs of two-buckle Arctics and two or three thousand pairs of boots, mostly of the "Storm King" variety. The navy uses about ten thousand pairs of rubber boots per year and has lately discovered the suitability of the tennis shoe for life on shipboard and orders annually about twenty-five thousand pairs of these very light rubber-soled shoes. In addition to the quantities already mentioned, the marines require about twelve hundred pairs of boots and Arctics during the year. It will be seen that these are not extremely large figures, but still no rubber footwear manufacturer is disposed to turn a deaf ear to a government contract.

THE POSSIBILITIES OF THE MOTORCYCLE.

THERE has been a tendency to look upon the motor cycle as a plaything, chiefly characterized by the amount of noise it could emit, but it is beginning to be appreciated that this obstreperous vehicle has vast and various possibilities of utility.

To illustrate, the English postal authorities have found after much experimentation that the rural carrier equipped with a motor with side car attachment can deliver two mails where the horse delivers only one, and at one-half the expense. The free rural delivery system of the United States covers over 1,100,000 miles of highway. If in this great system the faithful but plodding horse could be eliminated and the fleet motorcycle take his place, the economy in time, not to mention the saving in provisioning, would make a tremendous aggregate.

The possibilities of the two-wheeled motor in war—discussed theoretically for some time past—is likely before this European upheaval is quieted to be given a very thorough test. A few companies of expert motorcyclists equipped with machine guns and trained in all the arts of modern war could make a swift descent upon the enemy and deal a blow out of all proportion to the number of men involved.

But probably the two-wheeled motor will display its greatest efficiency and utility as an adjunct of the fire departments, especially in smaller places where the maintenance of an extensive equipment would be too burdensome. Practically every fire starts in a small way. The most disastrous conflagrations could have been stopped with small damage if the means had been at hand immediately. The experienced fireman, with axe and chemical extinguisher, could on a motor reach the spot so quickly as often to snuff out the blaze at the very start. It will be remarkable if the motorcycle does not play an important part in the fire equipment of American cities and towns in the near future.

ELBERT HUBBARD SAYS THAT DR. B. F. GOODRICH was the inventor of the pneumatic tire. The editor of this paper knew Dr. Goodrich fairly well, and had from his own lips the story of his life, but no such claim was then made. If there is any truth in the story proofs should be offered, that due credit be given. Otherwise it will be set down as merely another Hubbardesque fancy.

Some Neglected Nearby Markets—III.

GUATEMALA.

PERSONS living in the states of the upper Mississippi Valley and those living within a hundred miles or so of New York may see at any time from May to late September a tiny bird about five inches long from the point of its slender beak to the tip of its tail. It is of a golden yellow for the most part, but its wings are of a grayish blue, which gives it its common or garden name of blue-winged warbler. Its blue wings are undeniable, but its warble is about like that of a house cricket convalescing from a month's illness. Its comparative rarity, its beauty and its great usefulness as an insect destroyer make it a deserved favorite with the nature lover as well as the economist.

During the summer he flits about our gardens and orchards, singing the best that he can—even if not very well—and brings

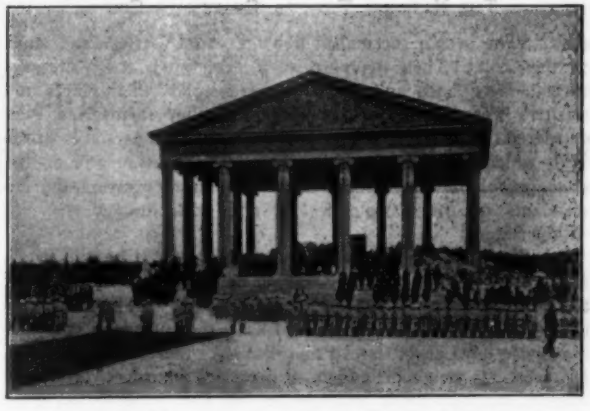
BUENA VISTA STATION, GUATEMALA CENTRAL RAILROAD.

up his family; being occasionally married to his cousin, the blue, golden-winged warbler. When the first frosts come he starts southward and goes on until, in October, he has reached the Gulf of Mexico. Here he rests a few days and takes a few good square meals. Then he spreads his blue little wings, launches out over the vast waters of the gulf and is soon out of sight of land with the illimitable sky above, the far horizon on every side and the storm-tossed billows beneath. The sun goes down at the western water's edge and the stars keep watch on the brave little traveler, flying dauntlessly between sea and sky. The sun rises and shows him a palm-lined southern shore, where he may rest and feed and sing the best he knows how.

Is it the voice of cold commercialism we hear, asking what all this has to do with the rubber business? It is; and such questions are not new. But we insist that a lesson may be learned from our little blue-winged warbler. Wherever he spends his summers, in Iowa, Ohio or New York, he is sure to go to Guatemala for the winter. And why? Because there is something there that he wants; so he is going after it, even if he has to fly across the Gulf of Mexico. And the point of the whole matter is that if he can cross the Gulf of Mexico, with only his blue little wings for support and only a few bugs and worms for his reward, why cannot an American cross in a comfortable steamship, to get the dollars that are there waiting for him to come and take them?

Guatemala is the largest of the Central American states and adjoins our afflicted neighbor, Mexico. It was, indeed, politically, a part of that country for a time, but a very short time. In 1822 Iturbide, who called himself Emperor of Mexico, annexed Guatemala, but the annexation lasted only as long as the empire, and when, a year after the event just described, the self-made emperor was chased across the Atlantic, Guatemala was again independent. He came back—not in the sense expressed by modern slang—the next year, but the climate of our hemisphere has never been healthy for emperors and Iturbide died suddenly—in front of a firing squad. Since then, in spite of political disorders and the handicaps produced by three centuries of foreign bondage, Guatemala has advanced in wealth, population and civilization. It has a population of about two million, living on an area slightly greater than that of Louisiana. And it is so near to that state that our little warbler can fly across the intervening waters without stopping for rest or food.

The soil of Guatemala is considered by many as the most fertile of any country on earth. It is basically of volcanic ash and with this is mingled the humus produced by the decay, through countless centuries, of an inexpressibly luxuriant tropical vegetation. With such a soil, with drought and winter unknown, Guatemala possesses almost boundless possibilities of wealth. As the republic lies fifteen degrees north of the equator the sun at midwinter occupies the same place above the Guatemalan horizon that it does in New York about the middle of September. And twice each year, in May and in July, the great



TEMPLE OF MINERVA, SCENE OF SCHOLASTIC FESTIVALS, GUATEMALA CITY.

daystar passes directiy overhead, shining down chimneys and to the bottoms of wells. But there is no excessive heat, for Guatemala, with nearly all the country at an elevation of four to ten thousand feet and lying between two oceans, enjoys a salubrity of climate approached by few other countries.

Of the people, more than half are pure Indian and only a few thousand are pure white, the remainder being of mixed blood. But this need not worry us. Many of the ablest men in the republics south of us have been wholly or in part of Indian extraction and in the only state of our own country where Indians are numerous—Oklahoma—they furnish a citizenry of which we have no reason to be ashamed. In Guatemala, as elsewhere, the so-called lower classes are coming into their own. That the native stock is not lacking in capacity is proved by the astonishing ruins which are found not only throughout Guatemala but in the neighboring parts of Mexico—ruins of great buildings erected by the ancestors of the meek, brown natives of the present day. These structures, which rivaled those of ancient Egypt and Assyria in massiveness and picturesque detail, were not the work of a people of low capacity. They had a civilization which in time would undoubtedly have worked out

the highest results if they had not fallen under the foot of the ruthless conqueror. The assumption that the present natives are descended from the builders of the temples and pyramids is based upon the fact that from the beginning of history, with the exception of the eastern United States and the West Indies, no important native population has ever been subjected to wholesale extermination or displacement.

To this people, peaceful, prosperous and happy, came white men, bearing the cross of Christianity and the banners of Spain. Also they brought whips, chains, firebrands and weapons of

THE NATIONAL THEATER, GUATEMALA CITY.

death. The people succumbed like the sheep between the fangs of the wolf. Their temples were desecrated, their libraries burned, their lands and buildings were stolen, their chiefs and teachers were burned at the stake and they themselves were murdered or, whipped and manacled, set to work as slaves in the fields which but yesterday were their own. Is it surprising that after four hundred years of subjection and repression the descendants of that people feel a trifle discouraged and unenterprising?

But the Indian is no longer a slave and may, if he will, work for himself. He is gradually waking up, but we must be patient and give him time to rub his eyes. An observant traveler says that when anything new is pressed upon the Indian he says that his people have never used it and dismisses the question. When, however, his neighbor adopts a new and improved article or method, his own pride will not let him rest until he has done as well. It is in the judicious cultivation of this trait that the business missionary finds his greatest success. For instance, there is in Guatemala an annual sale of several thousand dollars' worth of mackintoshes, all of which are, or recently were, imported from Great Britain and Germany. Certainly there ought to be a thousand times as many rubber garments sold there and they ought to come from the same nearby land as does the blue-winged warbler. This is the way one visitor describes the rains down there: "The raindrops are about as big as oranges and of a peculiarly wet character; they come down at the rate of about five thousand a minute and hit you everywhere at the same time." That the natives are not sufficiently amphibious to relish this daily meteorological experience is proved by a photograph which the editor of THE INDIA RUBBER WORLD brought back a few years ago from the Mexican state of Chiapas, which adjoins Guatemala. It represented an Indian laborer wearing a native rain-shed of cane fibre, which is the only kind used by the poorer classes in that part of the world. It looks like a corn-shock walking around on two bare feet and surmounted by a volcanic Mexican hat.

The small but steady sale of mackintoshes in Guatemala proves that they are appreciated by their wearers, who, no doubt, are chiefly in the cities. If a salesman thoroughly conversant with the customs and language of the people should go through the rural districts during the rainy season and should hire persuasive natives to furnish the object lesson and preach the evangel of rubber rain-coats, beyond question a large and permanent trade could be obtained. True, the laborers are poor, but this condition is changing year by year and there could be no investment that would yield proportionately greater comfort.

The entire volume of the commerce between the United States and Guatemala is still comprised within rather small figures. Our imports from that country, of all kinds, for 1912, amounted to $2,644,037 and in 1913 to $3,106,981, while our exports of all kinds to that country during these two years amounted to $2,519,052 and $3,658,587. Our imports of rubber from Guatemala in 1912 amounted to 166,443 pounds, valued at $85,936, while in 1913 the number of pounds decreased slightly, being 133,230, but the rubber was evidently a better quality, as its value amounted to $91,190. Incidentally it might be added that Guatemala levies an export duty on rubber shipped from that country of 1½ cents (American gold) per pound, but the president of the republic issued a decree on May 31 last suspending this export duty for a period of six months, owing to the general fall in the price of rubber.

Our exports of rubber manufactured goods to Guatemala for the last two years are shown in the following table:

	1912	1913
Belting, packing and hose	$6,179	$8,694
Shoes—pairs	225	72
value	$318	$49
Automobile tires	2,178	2,224
Other tires	871	672
Other rubber goods	2,612	5,393
Total	$12,158	$17,032

It will be noticed from this table that our exports of rubber manufactured goods increased in 1913 by about 40 per cent. over the preceding year, but the items are really pitifully small. Think of selling less than $9,000 worth of belting, packing and hose in a nearby country where there are magnificent forests of mahogany and other cabinet woods which economically cut down and converted into lumber would be a source of vast revenue. And there is the item of rubber shoe exports—72 pairs during the whole year, in a country where there are 2,000,000 pairs of feet. The value of American tires sold in Guatemala, it will be noticed, was less than $3,000 last year—just about tires enough to supply 15 or 20 machines.

The item "Other Rubber Goods," which includes all that great class of articles known as druggists' sundries, amounted last year to a little over $5,000; and yet there is one city alone—Guatemala City—with a population close to 100,000 and with a very considerable proportion of this number consisting of well-to-do people who certainly ought to be interested in the ordinary comforts of life. It should be possible to sell there whatever it is possible to sell in New Orleans and Galveston or, excepting a few articles adapted for cold climates, anything that can be sold in any city in the United States. If the figures just given seem small, they furnish at once a proof that the market is there and that its exploitation has just begun. One curious item of trade is that of elastic goring for the "Congress" style of shoes, of which about $10,000 worth annually is imported into that country. Germany furnishes nearly all of it, the United States figuring, if at all, in a very small way.

The chief port of Guatemala is Puerto Barrios, on the Atlantic Coast, which has more than half of the whole country's foreign trade. On the Pacific side is San José, which handles more than half the remainder, and Champerico, which, in turn, takes more than half of what still remains. Livingston, on the Atlantic and Ocos, on the Pacific, complete the list.

Puerto Barrios has a railroad which runs to Guatemala City in the interior and thence to the Pacific Coast, with the principal towns of which it is connected. The hotels of the republic are said to be very good as to food and fair otherwise, with very

moderate rates ranging from ten to fifty dollars a day—let us hasten to add—in Guatemalan money, which, as the market fluctuates, may be purchased with American gold at the rate of twelve to sixteen Guatemalan for one American.

The indispensable requirements of the salesman are that he must speak the Spanish language and that he have a sympathetic understanding of Spanish-American ideas and customs. He must not attempt to drive things American fashion and, if his customer says "Manana," manana let it be. The merchant or manufacturer must, in his turn, fill orders as given and follow packing and shipping regulations to the letter. The purchaser may be presumed to know what he wants and why he wants it, and as he is paying for what he gets, he is entitled to have his wishes respected. In the matter of credits it is also necessary to respect the customs of the country. In respect to nearness the United States has so great an advantage over European competitors that, if our business men fail to reap the benefit, it is their own fault.

The Future of the Rubber Industry On the Upper Amazon.

By Adolfo Ballivian, Consul General from Bolivia to New York.

A CAREFUL study of the interesting reports on the Oriental and Amazonian rival regions made by Mr. C. E. Akers, and of the opinions of authorities such as THE INDIA RUBBER WORLD, of New York, shows conclusively the future possibilities of the rubber industry in the Amazon Valley. We will not, therefore, attempt to analyze the valuable and complete information therein given, but will only refer to those original sources, calling attention to some of their important features. Mr. Akers says in his report:

"In the East the industry was founded from seed taken from Itaituba, on the Tapajós, in 1876, reproducing the white variety (not the best), and yielding an inferior rubber classified as 'weak' (*fraca*) in the markets of Manaos and Para." All the rubber produced in the Orient originated from such inferior seed.

Mr. Akers continues: "In the Amazon Valley the varieties principally utilized are black (*preta*), the best; white (*branca*); red (*Vermelho*); Barriguda (*Hevea spruceana*), and Itapiru (*Hevea guayanensis*). . . . In the East the rubber tree is planted upon many different classes of soil, and with the aid of careful cultivation it thrives in a surprising manner in most localities, with the exception of undrained, swampy lands. Throughout the Amazon Valley the soil is an alluvial deposit on yellow or red clay, and rich in vegetable matter, brought down by the rivers and spread over the land by annual floods. In many districts of the lower Amazon the trees have their roots permanently below the water level, and flourish under such circumstances—in direct contrast to the experience of the Orient.

"In the Orient the rubber trees are carefully and systematically cultivated and all possible assistance extended to foster rapid development. In Brazil the tree is the natural product of the forest, and as yet no effort whatever has been made to aid its growth. . . . In the East the seed is selected with care, planted in specially prepared nurseries, and the young trees transplanted subsequently to land where the conditions afford every possible chance for both branch and root growth."

We ask, what would be the result if the same careful methods should be employed in the Amazon Valley?

"In the East," again Mr. Akers says, "a rubber tree, 75 feet high with a girth of 100 inches at 3 feet from the ground is looked upon as a giant. In the Amazon Valley a tree 130 feet high and 200 inches in girth is not considered anything out of the common. . . . On the River Madeira a little supervision has been attempted, but elsewhere the proprietors have looked on with apathy at the practical destruction of their trees, owing in great part to the fact that the number that could be reached in the forest was so great that a fresh source of supply could be opened up when the existing ones were worthless. . . . Economical methods are unknown on Brazilian rubber property, and in consequence the loss in value in both quality and quantity from the time the latex is extracted from the tree to the date of sale, apart from the loss of weight, is certainly not less than 10 per cent., and often very much greater.

"In the Malay Peninsula a fair basis of price for bringing 1,000 acres of rubber into bearing is £30 ($150) per acre. In the Amazon Valley the only initial expenditure required is for the construction of houses for the administration and the cost of bringing the collectors to the property, this latter expense being recovered subsequently from the men.

"In the Amazon Valley a marked reduction in the cost of production can be accomplished by improved methods of tapping; increasing production without additional labor, by more systematic administration; by opening up the resources of untouched trees; by cheapening the price of living; by diminution or abolition of export duties, and by the introduction of Chinese (we would suggest Japanese in preference, as they have already gone of their own accord to the Bolivian rubber district with various trades), or European immigration. By such means only it is possible for Brazil to meet successfully the competition of the Orient in the world's markets. That such reduced costs can be brought about I have no doubt whatever, if the measures indicated elsewhere in this report are adopted without undue delay."

If this is such good advice for the Brazilian rubber industry, how much more valuable is it for the Bolivian rubber gatherers and planters! The import and export custom duties are very liberal, and recently the duties on rubber have been considerably reduced, following a scale according to the market price of the article and representing, at the actual price, only a cent and a half per pound of rubber.

The lower Amazon is subjected to longer floods; the rubber trees are more scattered; they do not yield so much, nor is the quality to be compared with that of the up-river regions—as the Acre, Purus, and especially the Abuna River on the Bolivia-Brazilian frontier—whence comes the best rubber known in the world.

It is a well known fact that there has never yet been organized an economical or well-managed plantation such as that recommended by Mr. Akers, either in Brazil or Bolivia, and if some attempts have been made which naturally resulted in failure, they were merely due to defective administration. Those sad experiences can now be turned to advantage in the new organization of plantations, as well as in the exploitation of virgin forests on the up-river estates, especially in Bolivia; adopting the economical methods of the East and employing Japanese laborers, as recently a treaty between Japan and Bolivia has been signed.

Although the original price of land in the Orient, as well as in the Amazon Valley, was very low, it has risen in many cases to enormous figures. In the Orient £95 ($475) per acre, and in some cases $1,000 per acre, has been paid for plantations. In Bolivia, in the same way, although the original official price was $0.16 per acre, the grants have been stopped, and private property has been estimated at $720 per acre. Owing to the prices caused by the low value of rubber it is possible to acquire valuable estates close to the Madeira-Mamoré Railway and

near to Porto Velho on the Madeira, the starting point of said railroad, at a price of about $5 per acre.

We close this article by reproducing an interesting prognostication recently published (in "The World's Work" of February, 1914) by Mr. Henry C. Pearson:

THE FUTURE OF RUBBER.

"As to the future, if the ratio of increase in production and planting remains the same, the production of plantation rubber in the next five years should reach 500,000,000 pounds. Such an output would probably mean a drop in price to at least 50 cents a pound. It would also mean a wonderful expansion of the rubber manufacturing industry in new and unguessed lines, as well as in the old. But will Nature allow such areas of one growth to supplant all others? Will not rubber have its boll weevil, its scale, its bud rot? The planters have from the beginning fought white ants, canker, caterpillars; and the entomologists and mycologists of the world are on the alert to defend these new plantations. Will it not happen that these closely planted areas will suffer and perhaps be wiped out as coffee was wiped out of Ceylon? And will it therefore not come about that a wider distribution of planted areas will be necessary—one that will include tropical Central and South America, Africa, and our own Philippines, and thus assure the permanence of this most valuable product?"

In favorable contrast with the Oriental lands, which only produce some tea during the six to ten years required for the maturing of the rubber trees, the Bolivian lands will yield sufficient rubber from the wild trees to cover all expenses and leave a gratifying surplus."

From the "Pan-American Bulletin" of July, we insert the following:

"The British minister to Bolivia (Hon. Cecil Gosling) recently made a report on Bolivian trade and conditions, in which the rubber industry was extensively discussed, and a tribute paid to its excellent qualities. The report deals with the four varieties of rubber trees which abound in Bolivia, the localities where each are found, the condition and price of laborers for gathering the rubber, the export tax—which is likely to be reduced from 12 to 2 per cent. ad valorem—etc. Bolivia stands next to Brazil in amount of rubber production."

SENHOR TERENCIO PORTA.

Much sympathy has been expressed with the family of Senhor Terencio Porta, an esteemed member of the editorial staff of the Para "Folha do Norte," who died early in June of grip and pleuro-pneumonia. The funeral services were largely attended and the body was followed to the grave by many members of societies to which the deceased belonged. He was 26 years of age, and a native of Pernambuco.

DR. GASPAR VIANNA.

The death at Rio de Janeiro on June 15 of Dr. Gaspar Vianna, the talented young scientist, was a great shock to his many friends in Para, of which city he was a native. Funeral services were held at the cathedral, a meeting of condolence being also held, under the presidency of Dr. Eneas Martins, president of the State of Para, which was attended by a large number of leading Para officials and citizens.

THE BRAZILIAN RUBBER CRISIS.

The Brazilian population, which gave up agriculture for rubber in the halcyon days of the latter, now that the tide has turned, is returning to its old agricultural pursuits. In fact, the woods are losing their denizens, while the towns and villages are getting back their old inhabitants. In particular, the zone of the Bragança railway is displaying the tendency of "going back to the land."

In a recent month 6,502 persons arrived at the port of Para; departures in that time numbered 3,537.

BOUNDARY DISPUTE BETWEEN PARA AND AMAZONAS.

A suit is pending in the Brazilian courts in which the State of Amazonas is protesting against certain acts of usurpation by Para. These acts include the passing of laws by the latter State for execution in the former, thus exercising an unlawful jurisdiction and violating the federal constitution.

COMMERCIAL INVESTMENT ASSOCIATION, PARA.

At the special meeting lately held for the election of officials, Henrique Tancredo Leite was chosen as president, and Floberto Martins as first secretary of the deliberative council; the fiscal and administrative councils being respectively under the presidency of José Pinto Simones and Antonio Mendes Fernandes.

EXPERIMENTAL RUBBER STATION AT MANAOS.

Advice has been received by THE INDIA RUBBER WORLD from the Experimental Station for Rubber Cultivation at Manáos that official permission has been granted by the Federal Government for the director of the experimental rubber station and the chief of the agricultural section to enter upon their duties in accordance with the federal decree of May 14 last.

A BRAZILIAN EXPLOITATION COMPANY SUSPENDS.

The directors of the Brazilian Commercial, Industrial and Rural Co. met in their New York office on August 14 and passed resolutions to the effect that owing to the present conflict in Europe and the financial conditions on the Continent it would be impossible for the company to raise capital at this time for the exploitation of its properties in the State of Pará, Brazil, as it was solely dependent upon its European branches for financial aid, and that in consequence the company after August 22 would suspend all business until further notice.

SENOR MENDES ON THE AMAZON SITUATION.

At a luncheon given to the delegates to the recent rubber exhibition in London, Senor J. A. Mendes, delegate of the Commercial Association of Para, spoke on the situation in the Amazon at the present time. He expressed himself as very sanguine that the Amazon country after it emerged from its present trying situation would be on a sounder and more favorable basis than ever before. He continued:

"As regards the severe fall in prices that has affected the Amazonian Valley, those ignorant not only of conditions there but of the enormous capability of recuperation that such a fertile land has think that our days as a rubber-producing center are past. This is not the case. It was natural that in two States like Para and Amazonas, counting only on india rubber as their source of revenue, the financial conditions should be disorganized by the large decrease in the value of this article, still so heavily taxed to face the keen competition from the Far East. Nevertheless, the physical properties of our rubber will always be appreciated by the manufacturing world, and that industry of ours has shown stupendous resistance by coming to the primary markets in large quantities. Everything points to the fact that as soon as the effects of the present crisis are past the prevailing low prices will not only change the obnoxious methods of trading there but will necessarily result in larger crops. As soon as we adapt ourselves to these new conditions—and this is now being done in Amazonas—I do not see how we shall fail to produce rubber cheaply enough to remunerate its extraction."

NO CRIMINAL PROSECUTION OF MEXICAN CRUDE RUBBER CO.

The Mexican Crude Rubber Co., of Detroit, Michigan, whose plant was wrecked on May 15 last by an explosion which killed ten men, is not to be prosecuted criminally, although the coroner's jury rendered a verdict that the explosion was due to "negligence and ignorance on the part of the officials of the Mexican Crude Rubber Co." A careful review of the evidence offered at the inquest showed, however, the impossibility of pinning the matter down to any one of the six different causes out of which the accident might have occurred.

Growing Rubber in Ohio.

OHIO has had such overwhelming success in the production of rubber goods, why should it not also succeed in the production of crude rubber?

Mr. Charles P. Fox, a well-known rubber chemist of that state, is authority for the statement that Ohio can and does produce crude rubber in two different varieties of plants, but unfortunately the percentage of rubber in these Ohio botanical rubber plants is so small as compared with the percentage of profit in the Ohio rubber plants of brick and mortar that there is not likely to be any immediate rush into the occupation of producing crude rubber in that state.

Mr. Fox read two interesting papers at the last two annual meetings of the Ohio Academy of Science. Both of these—the first paper entitled "Ohio Grown Rubber" and the second entitled "Another Ohio Grown Rubber"—were printed in the "Ohio Naturalist."

While not encouraging from the standpoint of the investor, these papers are distinctly interesting from the standpoint of rubber botany. We produce them below:

OHIO GROWN RUBBER.

Product of Common Milkweed (Asclepias Syriaca). A common plant belonging to the *Asclepiadeae;* found abundantly

PLANT AT LEFT, MILKWEED (*Asclepias Syriaca*), WHICH GROWS ABUNDANTLY EVERYWHERE IN THE UNITED STATES. PLANT AT RIGHT, MILKWEED (*Asclepias Cornutii*). BEST EXAMPLE OF A NATIVE RUBBER PRODUCING PLANT IN THE NORTH TEMPERATE ZONE.

throughout the United States; classed as a weed, convicted as a bee-killer, advocated as a rubber producer. Too well known to need description.

Latex. Milk-like, thin; acid or neutral reaction; characteristic odor of milkweed; does not coagulate on standing in a closed vessel; imperfectly coagulated by acids; thickened or partially coagulated by ammonia; coagulated by heat; coagulated by alcohol.

Coagulated Latex. The coagulum is plastic and can be molded into cakes resembling some of the cheaper grades of rubber. The whey contains mineral matter and sugar.

Caoutchouc. Obtained from the coagulum. Is flabby; lacks strength and firmness; is high in gravity. Responds to the sulphur chloride and bromide tests. Yield of rubber, on basis of latex, is 2 to 3 per cent.

Resin. White, tasteless, odorless. Gives "asclepione," described by Watts as radiating crystals insoluble in water and alcohol, and is not attacked by dilute caustic.

This plant has been suggested as a source of crude rubber. The project has engaged the serious attention of several parties during the past twenty years. A careful study of the question, covering a period of twelve years, indicates that while rubber is a product of the plant, the amount is so small, its quality is so inferior and its cost of production is so high, that a profitable industry is out of the question.

ANOTHER OHIO GROWN RUBBER.

Of the many kinds of crude rubber, the botanical family, *Apocynaceae,* produces its share of good grades. Mangabeira (genus *Hancornia* in Brazil), Benguela root rubber (*Landolphia*) and *Funtumia,* both Africans, are notable examples.

The *Apocynaceae* are trees, shrubs and herbs, with a milky acrid juice, numbering some 1,000 species, grouped into 130 genera, inhabiting sub-tropical areas. This family of plants produces a varied line of economic products, such as edible fruits, dyes, drugs, fibres, ornamental plants and caoutchouc. The Madagascar Ordeal Plant, whose seed contains the most powerful poison known, and Eden's Forbidden Fruit, register here.

Several members of the type genus *Apocynum,* of this family, are common to the United States, the so-called Indian Hemp, *Apocynum cannabium* and *A. androsaemifolium.* During the summer of 1911 I examined the latex of the latter species for quantity and quality of its rubber. The results of this investigation show that the latex of this plant gives a small quantity of good grade rubber.

The latex is white, viscous, neutral or slightly acid, and has the strong acrid odor peculiar to this plant. The latex reacts with the usual coagulating reagents, in the following manner:

Acids do not coagulate; latex becomes thin.

Alkalies do not coagulate; restore the viscosity; change the color from white to brownish yellow.

Boiling coagulates slightly and slowly.

Acetone in proportion of one-tenth volume coagulates immediately and completely; liquid is colored chocolate red.

Formaldehyde coagulates readily, but is much slower than acetone.

Phenol coagulates the latex, but gives a soft product.

Salt solution coagulates slowly, giving a finely divided precipitate, hard to coalesce. Boiling the saline solution gives a soft product; not successful. Of the above methods, the use of acetone or alcohol, and formaline, are the only ones recommended. Of these two, acetone is preferred.

The latex of *Apocynum* differs from that of *Asclepias* in that it coagulates spontaneously, even if it is kept in closed containers. The spontaneously coagulated latex gives:

Liquid portion	67.58 per cent.
Cheese (wet)	32.42 per cent.

The liquid is white, slightly acid and acrid in odor. This liquid failed to coagulate after addition of more acid. Slight excess of alkali increased its viscosity, changed its color from white to brownish yellow, but did not coagulate or precipitate it. Boiling had no effect. Excess of acetone gave a finely divided precipitate, the particles of which were not cohesive. Evaporation of the mixture, after washing with water and treatment with boiling

acetone, gave a small quantity of black, soft rubber, destitute of strength. The cheese was composed of:

Water	33.06 per cent.
Rubber	3.99 per cent.
Resin	62.95 per cent.

Working up this cheese of the plant in the usual manner with solvents, straining through gauze to remove dirt, evaporating, with low heat, the excess of solvent, adding an excess of precipitant, washing the precipitant and dissipating the precipitating agent, gave a good grade rubber.

The rubber obtained in this manner is black, firm, not tacky, odorless and strong. In quality it is much better than the product obtained from its neighbor, milkweed. The qualities of this rubber confirm the old adage that "blood is thicker than water," and prove a more apt one, that "Apocynaceous rubbers are good rubbers."

Milkweed latex, however, is richer in rubber than that of Indian Hemp, but in both cases is entirely too small to be profitable. Of the total rubber present in the latex, 96 per cent. of it is won in the cheese formed by the natural coagulation of the latex Ninety-six per cent. of the total rubber found ranks as Grade A, and four per cent. grades as C.

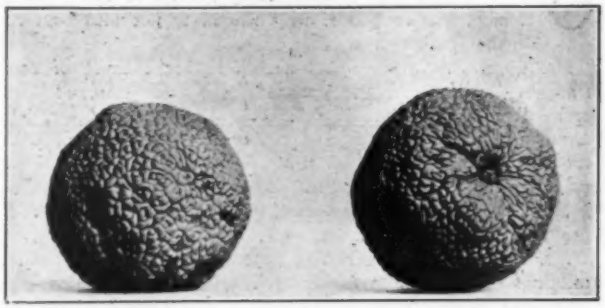
The resin is mahogany red, transparent, medium hard, with slight characteristic odor and tasteless.

TWO SPECIMENS OF INDIAN HEMP (*Apocynum cannabium*)—A VERY COMMON WEED.

During this investigation we have found that the soil conditions under which the plant was grown exert an influence upon the amount of rubber in the latex. Plants grown upon dry, sandy soil of West Akron gave a latex containing 2.27 per cent. rubber and 20.69 per cent. resin. The latex of plants grown upon the wet swamps of South Akron contained 1.12 per cent. rubber and 15.04 per cent. resin. Rubber from dry grown plants is of better quality than that of wet grown plants.

Natural latex from dry *Apocynum* contains:

Water	72.20 per cent.
Solids	26.21 per cent.
Ash	1.59 per cent.



FRUIT OF THE OSAGE ORANGE. DOES NOT CONTAIN RUBBER, BUT JUICE IS EXTREMELY STICKY.

This rubber content in fresh latex is 2.36 per cent.

The above figures refer to latex taken from plants near the end of the growing season.

Apocynum also gives apocynine, a drug having a similar action to digitalis and, according to Biddle, being an efficacious remedy in dropsy. The bark of this plant gives a strong, tough fibre, at one time much esteemed by the American Indians for bowstrings and fishing nets.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A European firm is in the market for gutta percha rosin, used in the manufacture of sealing wax. A special quality only will be considered, in quantities up to 1,500 tons per annum, and quotations should be c.i.f. Danzig, Germany. Report No. 13,482.

An American consul reports that the largest firm of automobile dealers in his district desires catalogs and prices—in Spanish or French—from makers of automobile tires, cushions, curtains and accessories. Report No. 13,487.

An European firm enjoying a good reputation desires to represent an American manufacturer of India rubber hose for water, gas and other purposes, also other kinds of rubber goods. Report No. 13,548.

A European business firm has requested the assistance of an American consulate in securing connections with first-class American concerns, to handle rubber goods, etc. The firm has recently determined to devote particular attention to American goods. Report No. 13,562.

An English manufacturer of dry battery ignition coils, etc., for motor cars, motor boats and motorcycles, desires to communicate with American manufacturers of rubber impregnated insulation tape for electrical purposes. He is ready to place a large contract and states that the matter is urgent and that he would like as quick a response as possible. He also states that he is in a position to supply first-class references. Report No. 13,568.

BOLIVIA AND COSTA RICA SEEKING A MARKET FOR BALATA AND RUBBER.

Telegrams have been received by the Bureau of Foreign and Domestic Commerce, Washington, from American consuls at Panama, San José (Costa Rica) and La Paz (Bolivia), with information regarding, respectively, balata and rubber for which a market is desired.

AUSTRALIAN RUBBER COMPANY RESUMES ORIGINAL NAME.

The company originally known as The Colonial Rubber Co., Ltd., rubber manufacturers and merchants, of Sydney, New South Wales, and which later changed its name to The Johnston Tyre & Colonial Rubber Co., Ltd., announces that it has resumed its former title.

Plantation Rubber Supplies.

How Mixed Consignments May Occur and How the Difficulty Can Be Overcome.

By E. L. Killick, London.

THE statement is not infrequently made by or on behalf of a few American consumers of plantation rubber that in its passage from the producer in the East to the consumer in the West the commodity is intercepted in London, that the best grades are taken out and that the balance, very much mixed, is then forwarded to New York. Although it is no part of my purpose to whitewash those who handle the rubber in London, for I hold no brief for anyone engaged in the trade, such a sweeping statement as the foregoing forces one, however unwillingly, to take up a defensive attitude on behalf of the agencies in London concerned with the handling and distribution of the product.

Nor is it any part of my object to get behind the view said to be held in America in this matter and seek, by imputing ulterior motives, to belittle the charge. Doubtless there are wheels within wheels, and certain it is that a purchaser does not usually extol the goods he wishes to buy. The question is rather as to whether such a view as that already cited is in reality entertained in these days by manufacturers of the highest standing and experience in the United States. The business acumen of the American manufacturer is held in too high repute in this country to render possible a belief that he would tolerate for any length of time such a state of affairs as that under discussion. But where there is smoke there is fire, and it would, therefore, be too much to assert that the complaint in question is absolutely baseless and unjustifiable. However flimsy or remote, there must be some kind of foundation for the story. In the first place it is plausible, and it must be admitted the conditions at present ruling in the plantation rubber industry lend it color. On this account alone it may have become a sort of fetish to be hugged and handed on from one to another.

Now as to the origin of what at this juncture must be regarded as mainly fictitious: In the early days of plantation rubber, when no single estate had reached maturity and no individual property was producing in bulk, the commodity came to market in small consignments as numerous as they were varied in character. Ceylon was the first producer in the Middle East, hence all plantation rubber, much of which Ceylon would be ashamed to own, was dubbed "Ceylons." Some of it may have been *Funtumia*, or Ceara biscuits from African estates, or Rambong from the Dutch East Indies. It is not suggested that buyers in America were ignorant of the actual source of their supplies. The term was simple and comprehensive and was no doubt no more than a trade name. Nevertheless the term was unfortunate and without doubt has done much to injure the reputation of plantation rubber in general, apart from the slur cast upon the Ceylon product and the sin of omission in regard to British Malaya.

The plantations of the Orient, which in the minds of some at least signified Ceylon alone, were thus identified with all the rubbish masquerading under the name of plantation rubber. Anything but the accepted and familiar brands of wild rubber, however ill-prepared, whether Ceara, *Castilloa*, *Funtumia*, *Ficus* or *Hevea* was credited to the estates of the Middle East, or more particularly to Ceylon. But this was not all. Just as all plantation rubber was termed "Ceylons" so all sheet rubber came to be known as "Highlands." The story is still being retailed here that a certain American consumer once observed that he obtained all his supplies from that well-known Ceylon estate Highlands & Lowlands. This is assuredly a libel, for everybody knows that Highlands is one of the leading estates in the Malay Peninsula. Doubtless "Highlands" was merely a trade term like "Ceylons," nevertheless, its use gave rise to much misconception here—misconception of a kind that was scarcely advantageous to American consumers. To this is no doubt due the statement that at about the time of the Rubber Exhibition in New York something like 100 per cent. more "Highlands" rubber was being received than the entire estate produced. Such a state of affairs cannot be described as fraudulent. Dealers had merely adopted the term chosen by their customers for plantation sheet. There was apparently no guarantee that such supplies were the actual product of the Highlands & Lowlands estates in Selangor, Federated Malay States.

It is not suggested that there is less knowledge of the commodity displayed by American than British consumers. Abysmal ignorance is occasionally exhibited by users of plantation rubber in this country. If asked what the product actually is and how and where it is obtained, there are individual buyers who would be entirely at a loss. My point is, however, that the terms used by the trade in America gave rise to false impressions on this side, with the possible result that certain unscrupulous dealers taking ignorance for granted, attempted to foist upon their American customers supplies of plantation rubber that were not what they purported to be. But these matters are in the main things of the past. All the same, prejudice dies hard and plantation rubber proper has much to live down. The unfortunate terms applied to the product by the trade in America have, however, unwittingly been responsible for much of the harm done.

When plantation rubber first came to the market it was the product of certain tea plantations in Ceylon where *Hevea* had been interplanted. Preparation to a common standard was at that stage obviously impossible. Supplies differed widely. Consignments were small and usually arrived in tea chests. The American consumer who had been accustomed to receiving fine hard Pará in 3¼ hundred-weight cases, objected to the tea chests of, may be, 50 pounds of plantation rubber. He asked for the product to be bulked. Henceforward his plantation rubber came to him in larger cases, the contents of which often showed considerable variation, for in those days a consignment of, say, five tons had to be collected from dozens of small lots. Here I think we have the origin of the belief said to obtain in America today that consumers stand at a disadvantage in that their supplies are very much mixed and not up to the standard they require. As originally shipped, every separate consignment was traceable to its source, for its history was written on the case. By bulking together in London all individuality was lost, and the only good purpose served was to give the American consumer his supplies in larger cases. Here again we have to go back to ancient history to find the origin of views that are still in circulation.

For the rest, I submit that the charges made are not infrequently due to misconception on the part of consumers. Let us assume that an American manufacturer, who buys to type, requires five tons of type No. 15. Now this particular type may be a variety that is something midway between what are known as tree scrap and earth scrap. It is tolerably obvious that if an order for such a nondescript variety is to be fulfilled by a uniform material it must be obtained from one particular estate. The odds are, however, that no estate produces more than two or three per cent. of such a grade. What then is to be done? The five tons required must be made up of consignments from

different estates as near as possible to the type specified. There is no alternative. The variation may be more apparent than real, but it serves to perpetuate the belief that the buyer is being unfairly treated.

Let me give another example of the way misconception may arise. The property of a rubber plantation company may consist of several different estates or divisions, each of which has a native name. The company may derive its name from one division which we will say is Kuala. Rubber from each section is stamped with the name given to that section, so that a big consignment of the Kuala Company's rubber may contain but a small proportion marked "Kuala," the remainder being marked with various names all unfamiliar to the purchaser. He might reasonably suppose that he had received a mixed consignment, especially as the supplies from the various divisions would probably differ slightly in appearance. Nevertheless he is receiving a supply as uniform as it is possible to get.

In the foregoing I have merely sought to explain away misunderstandings. It is conceivable, however, that cases do arise from time to time which give cause for dissatisfaction or complaint. For example, if an American consumer, knowing the spot price of fine pale crêpe to be 2/3, cables an order for this grade at 2/2, he receives something that is not quite the finest quality of pale crepe. The best is done for him at the price. He is dissatisfied, because it is inferior to other consignments he may have received, but the fault is his own. A quotation of 2/3 for fine pale crepe means that is the price and no other figure. When a particular grade is wanted it is often necessary to buy the rubber from one estate. This may involve payment of a small premium. The manufacturer refuses and he is then obliged to buy collections, for there is no other course open to him. Then again there are admittedly dealers and dealers. An American firm whose representative in London has no axe of his own to grind is naturally better served than one that obtains its supplies from a dealer who is making all he can out of the market for himself. There is perhaps one other point I may touch upon and that is as to the speculator in the commodity in New York. It is obviously impossible for me to tell your readers anything they do not know on this score, but it does seem to the onlooker at this distance that the question of mixed consignments may not be unconnected with the operations of the New York speculator in the commodity.

In the ordinary way of business it is difficult of belief that the London dealer, in his own interests, would discriminate against his American customers. There are brokers in London who have dealt in hundreds of tons of plantation rubber going to American manufacturers without receiving a single complaint. It is doubtless the occasional exception that has given rise to the view that provides the text of this article. Nobody is better informed as to plantation rubber than the big American consumer, and it is no exaggeration to say that the major portion of the best plantation rubber produced goes to the United States. For years the emissaries of American manufacturing groups have scoured the Middle East gathering every scrap of knowledge to be obtained about plantation rubber. I, myself, ran across an American in the year 1911 on one of the "show" estates not many miles from Penang. He was traveling in the interests of a group of American manufacturers, and had already covered most of the best estates in Ceylon and conferred with most of the leading planters in the island. A month or two later I met him again in an out-of-the-way corner of Java. We journeyed together to a large plantation some fifty miles distant, where he stayed for several days, going into every detail of estate work connected with the tapping and preparation of plantation rubber. By that time he had compiled statistics of incalculable value to his principals and had acquired a knowledge of the plantation industry that can only be described as encyclopaedic. I doubt if there was an estate throughout the plantation zone as to the relative value of which he had not a very accurate idea. Certainly he knew every estate that was producing, or was likely to produce, the best grades of rubber. A few weeks ago I met him again at the Rubber Exhibition here. He was wandering round with an air of distinct boredom, and this I could only attribute to the fact that he had found no one who could tell him anything he did not know about plantation rubber. I take it that my acquaintance is only one among many men of similar experience, and I refuse to believe that the American manufacturer of any standing honestly thinks that he is not receiving fair treatment in the London market, for no consumer in the world is better informed than himself.

All the same, the fact should not be lost sight of that this is an extremely young industry. Within the space of a few short years the production of plantation rubber has increased from a few tons to a quantity in excess of all the rubber the rest of the world produces. Nor is that all. Although the product of the same *Hevea*, it is a totally different article from the hard Pará of South America. Its characteristics are far from being fully understood by the manufacturer, for no two manufacturers hold the same opinion about it. It is only within the past few months that plantation rubber has been frankly acknowledged by British consumers to be equal to and in some respects superior to fine hard Pará. Even so, opinion differs widely as to the relative merits of different grades. One obtains a 25 per cent. better result with pale crêpe than with smoked sheet. The experience of another is entirely the reverse. As this applies to every grade of cultivated rubber, the multiplicity of grades produced is not to be wondered at. Already the product is more highly standardized than Pará, but much still remains to be done. In some degree, however, the grower is waiting on the manufacturer. When the latter has finally made up his mind exactly what he wants, the producer will have little difficulty in supplying it. The planter was told that he could not produce good rubber. He has proved that he can. But one manufacturer may prefer to receive a dozen different kinds in a consignment whilst another requires but one. So long as such views exist the business is bound to remain somewhat chaotic.

The very immaturity of the industry is partly responsible for what is called the mixed nature of supplies. As the plantations come into full bearing and the total production increases, this fault will be minimized. It will, however, never be entirely eliminated so long as rubber is bought on appearance and physical tests. One of the anomalies of the situation is, that rubber which the well informed know to be equal to any produced may, if slightly mouldy, be obtained at a discount of a penny or twopence a pound from the prices for the "best" grades. The remedy, presumably, is to buy on specification dictated by vulcanizing tests. Efforts are being made to inaugurate such a system. If practicable, it is certain that no more will be heard about variability and the minor complaints which reach the market respecting plantation rubber.

There remains one other point to be dealt with, and that is perhaps the most important of all. Much has been heard of late as to the advantage (sic) of buying in the Eastern markets and shipping direct to America. Now there is at present one drawback, and that a very important one, to this method of doing business. The Rubber Trades Association of London has laid down certain definite standards of quality, and those standards are the highest known to the plantation industry. Conformation to those standards is strictly enforced and all queries are settled by an arbitration committee. The view is generally held that plantation rubber regarded as first or second quality in Singapore or Colombo would not necessarily pass those standards in London; in other words, that the London standard is higher than any other. It follows, therefore, that the buyer in London is protected in a way that is impossible in any other

market. As I have said, any disputes are settled by arbitration.

The development of the Mid Eastern markets would be welcome for more reasons than one, but unless or until they can give the buyer the same security and protection afforded in London, their growth will be checked.

No doubt the idea of shipping direct arose out of the suspicion that the American consumer is not receiving fair treatment in London. Although I have endeavored to show that this suspicion has little foundation in fact, there is no obvious reason why the buyer should not have supplies sent direct without intermediate handling in London. More especially would this apply in the case of forward contracts made with plantation companies. Assuming that the buyer trades in such a way as to avail himself of the protection afforded by the London market, the consignments would be sent direct from the plantation to New York, and samples despatched at the same time to the London broker. In the event of a dispute, the broker would submit the samples to the Rubber Trades Association, and the matter would be settled with the minimum of trouble.

It has been shown, then, that while there is no foundation for the statement that in the handling of plantation rubber in London the American consumer necessarily suffers, it is unfortunately true that consignments are more mixed than is desirable. But much of this is avoidable. If an American buyer wants five tons of fair average quality sheet, for example, he should give a list of the marks he knows will suit him. The dealer will then buy those marks. If, on the other hand, an order merely states five tons of smoked sheet, without further specification, the odds are that a mixed lot will be received. At present it is sometimes impossible to supply a norder for, say, twenty tons of a particular mark if the grade required is not one of the standard qualities. On the other hand, an order for fifty tons or more of fine pale crêpe can be executed without much difficulty. It is not a question of unfair treatment. The great variety of types produced and the mushroom growth of the industry are partly responsible for such trouble as arises. A better understanding of the capacity of the industry and a closer acquaintance with market conditions would remove much of the misapprehension that exists. Nothing but good can come of ventilating the position in every possible way, and if any of your readers care to express their views or to put questions, I shall be pleased to go further into matters through the medium of THE INDIA RUBBER WORLD.

WHAT THE RUBBER CHEMISTS ARE DOING.

THERE has recently been published by permission of the Bureau of Standards at Washington a method for the direct determination of rubber by combustion of the nitrosite and the determination of the carbon.

The action of sulphur trioxide on rubber was noticed very early, as Harries in 1901[1] described it, but all authorities agree that it seems to be of varying composition.

The proposed method seeks to avoid the difficulties which have been encountered in working previously with these compounds by determining the carbon content, which is said to remain constant or at least contain all the carbon of the rubber sample.

"The procedure in brief consists in first forming the nitrosite of rubber by the action of nitrogen trioxide gas upon a finely ground and acetone-extracted sample of the rubber suspended in chloroform. After the completion of the action the insoluble nitrosite, fillers, etc., are filtered from the chloroform and the nitrosite is dissolved in acetone; the suspension of finely divided mineral matter is then allowed to settle out or is thrown down with the centrifuge. An aliquot portion of the solution is transferred with a pipette into a small flask and its volume reduced by evaporation to a few centimeters. This small volume of the acetone solution of the nitrosite is now transferred with the help of ethyl acetate to a porcelain boat containing alundum, and after the acetone and the ethyl acetate have been expelled by warming the boat for several hours in the drying oven the nitrosite is burned in a current of oxygen, and the carbon dioxide formed is absorbed in soda lime and weighed."

The method proposed is to grind a sample to 20 Mesh if possible and weigh out ½ gram and extract with acetone in a Wiley or Cottle extractor. Transfer to a 50 c.c. flask and dissolve or swell in 40 c.c. of chloroform. Nitrogen trioxide is made from arsenic trioxide with 1.3 sp. gr. nitric acid, and this is passed through the rubber solution in chloroform kept cool by immersing the flask in water. A deep green color shows when enough has been used.

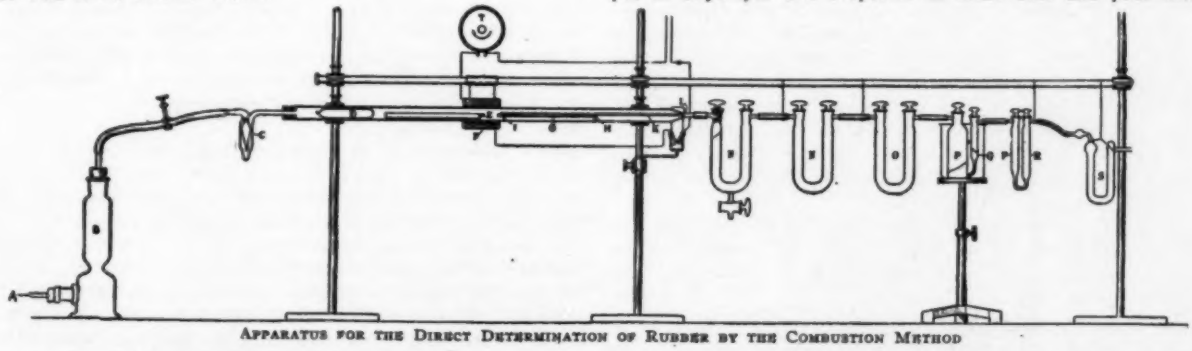
Filter the chloroform solution through a gooch and wash with chloroform and place the asbestos mat with nitrosite in a 75 c.c. beaker, dissolve in acetone and pour into the original graduated flask, make up to mark and settle and take out 25 c.c., and put in erlynmyer and evaporate to small bulk and pour into a small boat two-thirds full of alundum. Rinse with ethyl acetate, dry and place in the combustion tube.

As shown by the illustration herewith, the combustion tube is a Morse and Taylor tube with an electrically heated platinum spiral wire for a catalyzer.[2]

This is heated electrically by a nichrome coil on the outside insulated with asbestos and movable along the tube.

Otherwise this is about the usual combustion train as or-

[1]Berichte, 1901, vol. 34, p. 2991, and Journal Society Chemical Industry, 1901, p. 1123.
[2]E. & A. Cat. No. 2194.



APPARATUS FOR THE DIRECT DETERMINATION OF RUBBER BY THE COMBUSTION METHOD

TRADE FACILITATED BY NEW SHIPPING BILL.

With the passage of the new shipping bill the fleet of freight vessels owned by W. R. Grace & Co., importers, numbering ten and having a total tonnage of 50,000 tons, will be operated under the American flag. Most of these vessels are now in the South American trade, while four more are being built for the company for the Panama canal trade. It is also expected that the Standard Oil Co., now a fleet of 70 tank steamers, and the United Fruit Co. with 25 vessels floating the British flag, will join the American shipping contingent as soon as the necessary steps can be taken.

dinarily used for carbon determinations. The carbonic acid is absorbed by the soda lime in *P* and is weighed in the usual manner.

In considering this method it will be realized that after all this only determines the carbon in the rubber and the combustion method is known to be somewhat unreliable and troublesome. That this is so is shown by another paper, which has also been published with the consent of the Bureau of Standards recently and read at the Cincinnati meeting of the American Chemical Society.

In this paper, which is on the determination of carbon in iron and steel, the author, J. F. Cain, points out some of the difficulties in accurately determining carbon dioxide obtained during combustions of steels by the use of weighed absorption tubes. These are as follows:

1. The elaborate precautions required to prevent change in weight of the tube due to loss or gain of moisture as the gas is passed through.

2. Difficulties in weighing caused by electrical effects in wiping by buoyancy and by changes in temperature.

3. The necessity of maintaining constant conditions with respect to the atmosphere within the tube at each weighing.

4. Danger of getting chlorine or sulphur in the absorption tube from these substances in the sample.

5. The difficulty of determining whether the increase in weight of the tube is due solely to carbonic acid absorbed.

All the above objections will apply to the determination of carbon in rubber as well as in steel, as both are carried out in practically the same apparatus and by the same process.

Mr. Cain, therefore, recommends that the carbon be determined by absorbing the CO_2 in barium carbonate, thus precipitating it and afterwards titrating the carbonate after filtering. The barium carbonate is dissolved in an excess of hydrochloric acid and titrated back with standard barium hydrate. As phenol phthalein reacts alkaline with barium carbonate, methyl orange is used as indicator. This method of determining carbon seems far better than the one specified in the rubber analysis and should be adopted.

In using this method of determining rubber, it must be assumed that no substance present in the sample is insoluble in acetone that might be acted upon by nitrogen trioxide gas in the chloroform solution. It is assumed that this method is to be used for all classes of rubber goods and the substances which may be added in the mixing are, of course, of very diverse character. In the first place in many classes of rubber articles it would be impossible to separate the fibre from the sample before analyzing. It would be necessary to be sure that none of the fibres will be acted upon by the trioxide in any way that will give an insoluble product in the chloroform and dissolve in the acetone. It is certain that nitro-cellulose is such a product, and it should be proved that there are no like products formed from the trioxide of nitrogen.

It is also agreed by the authorities that acetone does not dissolve out completely all kinds of pitches or asphalts nor the substitutes which have been vulcanized to a high degree with sulphur when made.

In fact, the number of substances containing carbon which may be used in rubber compounding is almost unlimited and they are not all soluble in acetone, so that it must be assumed that the nitrogen trioxide has a highly selective affinity for the caoutchouc molecule.

Of course, if the method is to be limited to samples which contain only known compounds in addition to the rubber, then it is not of wide application.

In 1905 Caspari showed[3] that gutta percha and balata formed nitrosites the same as caoutchouc, so that this method would not distinguish between these substances.

[3]Journal Society Chemical Industry, 1905, p. 1274.

The present method sometimes used of determining rubber by difference is, of course, open to many objections, and it is hoped that a method will be found that will not only determine the rubber contents, but if possible determine the kind of rubber.

W. Vaubel and E. Weinruth[4] investigated the bromination method of Buddle-Axelrod and Vaubel. They found it unreliable except on Pará rubber. It failed to give concordant results on vulcanized rubber or on crude.

Pontio[5] recommends boiling vulcanized rubber with toluene, xylene and cymene which dissolve the caoutchouc. Filter while hot, then evaporate to a syrup and precipitate the pure caoutchouc with acetone.

The determination of carbon in the above precipitate would not be open to objections of liability to contamination with other carbon compounds that the first method is.

THE INFLUENCE OF NITROGEN COMPOUNDS ON THE VULCANIZATION OF RUBBER.

ONE of the most important results of modern chemical and scientific work is the recognition of the importance of small quantities of compounds or elements when present in the main commercial articles of chemical nature. Of course this recognition is not altogether a recent phenomenon, for one of the most important examples of this was the discovery of the controlling influence of minute quantities in the manufacture of Bessemer steel, and it was not till ores were obtained of low phosphorus content that this industry became possible. In Bessemer steel there must not be more than one-tenth per cent. of phosphorus or the material is worthless.

In the rubber industry it has not been until recently that this subject has been given much attention, particularly in relation to the small quantity of nitrogen found in most commercial samples of rubber.

Thus we find that Weber, in his pioneer work on rubber chemistry, notes the insoluble constituent of rubber but concludes that it was an oxidized hydrocarbon and a link between rubber and cellulose, and he omitted to examine the insoluble matter for nitrogen or to make any reference to nitrogen as being present in rubber, except in a mere hint on page 5, where he quotes Faraday's analysis of latex showing 1.90 per cent. of albumen. The subject is dismissed with the idea that with good coagulation work this "impurity" may be eliminated.

In 1907 Dr. David Spence ("Journal Society Chemical Industry," p. 1287, of 1907) investigated the subject of the distribution of protein in rubber, and found that in the insoluble part there was sometimes as much as 5.4 per cent. nitrogen. He considered it mainly protein; this would mean about 33 per cent. protein.

Even Schidrowitz, in his book published as late as 1911, while noting the work of Spence, does not disclose any knowledge of any effect of this nitrogen constituent on rubber, though noting that plantation varieties are deficient usually in nitrogen.

At the Eighth International Congress of Applied Chemistry, held in New York in the fall of 1912, Clayton Beadle and H. P. Stevens read a paper describing an investigation of *Hevea* latex and giving determinations of the nitrogen in the latex and in the dry crêpe produced. They found that the latices contained from 1.31 per cent. to 1.56 per cent. protein; that the percentage of protein of the total solids in the latex varied from 5.5 per cent. to 5.1 per cent., and that about one-half this protein was retained in the washed and coagulated rubber in the form of dry crêpe.

In the proceedings of this same congress, Lothar E. Weber gave results of experiments tending to show that the extraction of the resins from plantation sheet prevented vulcanization of the extracted sheet, but in an article by Stevens in the "Colloid

[4]Chem. Zeit., 1914, i. 82 from Gummi-Zeitung, 1913, pp. 28-92, and Journal Chemical Society, April, 1914, p. 301.

[5]Journal Chemical Society, April, 1914, p. 301; Annal. Chim. Anal., 1914, pp. 19-60.

Zeitschrift," which was noted in this journal for May, 1914, it was shown that the nitrogenous constituents had much influence and the resinous constituents little influence on vulcanization.

Clayton Beadle and H. P. Stevens separated the protein matter which contained the nitrogen from smoked sheet. ("India Rubber Journal," 1912, pp. 554-604; Abstracts in "Journal Society Chemical Industry," 1912, pp. 999 and 1099.) Then they vulcanized the nitrogenous part and the nitrogen free part and the original sheet. It was found that the part of the rubber with high nitrogen contents vulcanized more rapidly and combined with more sulphur than the original sheet, and that the nitrogen free part combined with the least. The strength and resiliency of the nitrogen containing part was the greatest, the original sheet being less, and the nitrogen extracted part was the weakest. To assure themselves that the solution in benzine was not the cause of the difference, they analyzed and cured four samples as follows:

1st, the original sheet untreated in any way.

2nd, an original sheet swelled in benzine.

3rd, the lower half of solution containing nitrogen and coloring matter.

4th, upper part free from nitrogen.

The nitrogen contents were as follows: No. 1—0.47 per cent.; No. 2—0.46 per cent.; No. 3—0.84 per cent., and No. 4—0.07 per cent. These were mixed with 7 per cent. sulphur and cured for three hours at the steam pressure given below, with the following results:

	Per Cent.			
	No. 1	No. 2	No. 3	No. 4
3 hours' cure at 35 lbs., comb'd sulphur.	2.5	2.3	3.2	0.9
3 hours' cure at 45 lbs., comb'd sulphur.	4.6	4.1	5.2	0.8
3 hours' cure at 55 lbs., comb'd sulphur.			6.4	3.6
3 hours' cure at 65 lbs., comb'd sulphur.			6.6	6.1

The tensile strengths and elongations of the cured samples were as follows:

	No. 1	No. 2	No. 3	No. 4
Three hours' cure at 35 lbs pressure,				
Tensile strength	59	53	75	13
Elongation	910	950	840	710
Three hours' cure at 45 lbs. pressure,				
Tensile strength	100	100	95	33
Elongation	740	780	600	1140
Three hours' cure at 55 lbs. pressure,				
Tensile strength	50	..	..	41
Elongation	470	..	..	960
Three hours' cure at 65 lbs. pressure,				
Tensile strength	40	..	..	30
Elongation	380	..	..	400

The resins were about the same in all samples.

The tensile strength is calculated in proportion to 100, taken as the best result.

In calculating the tensile strengths, those found for samples Nos. 1 and 2, at three hours' cure at 45 pounds pressure, were taken as 100, as these were the best results obtained from any of the specimens.

The above tables conclusively show the influence of the nitrogen compounds in hastening the cure and combining more sulphur in the same time, and they show how the lack of the nitrogenous constituent results in lack of cure, and a resulting poor tensile strength and elongation.

Turning from the natural constituents of rubber, it may be well to inquire whether nitrogenous compounds may be added to rubber to act as hasteners of vulcanization or to give improved products.

In the "Gummi Zeitung," No. 28, p. 731, it is shown that albumen added to rubber increases the speed of vulcanization.

In the French patent to the Xylos Rubber Co., No. 466,243, scrap rubber is heated with caustic soda and a small quantity of an aromatic amino compound; for example, aniline, which acts as a catalyst to unite the free and combined sulphur with the alkali.

In the German patent No. 265,221 of 1912, and English patent No. 11,530, 1913, Beyer & Co. claim a "process of facilitating the vulcanization of natural or artificial caoutchouc," in which piperidine or its homologues are added to the vulcanizing masses. As an example, where Para rubber and 10 per cent. sulphur—to which ½ per cent. piperidine has been added—are vulcanized at 135 degrees C. for 15 minutes, a completely vulcanized product containing 3.5 combined sulphur is claimed as a result. It is stated that without the use of the piperidine the same result would require an hour.

The same party, in German patent No. 266,618, uses piperidine or its homologues for producing hard rubber by adding 25 per cent. sulphur. In No. 266,619 they claim the use of derivatives or salts of piperidine. In No. 268,947 aliphatic amines, with open or closed chains and their derivatives, are said to be equally suitable with the above, and are claimed as also the addition product of carbon bi-sulphide and dimethylamine. In No. 269,512 it is claimed that with Para and 100 per cent. sulphur, and the addition of 1 per cent. of the compound of carbon bisulphide and dimethylamine, vulcanization takes place completely with 15 minutes' cure at 135 degrees C. In a previous patent, aniline was claimed for this object. Nearly all the agents above mentioned are basic organic nitrogen compounds and of the amino group; and these numerous instances of their use with rubber lead to the conclusion that amines in general have some hastening influence on the vulcanization of rubber.

In the German patent No. 273,744, of 1913, J. Ephraim improves synthetic, sticky or impure caoutchouc by adding from ½ per cent. to 10 per cent. sulphur, and enumerates various other reagents, among them being napthyl amine, and then heating at 140 degrees C. for one and a half hour. The heating is supposed to stop before the characteristic vulcanization takes place. It is claimed that this greatly improves caoutchouc.

In the German patent No. 273,482, of 1912, to W. Esch, the patentee incorporates a paste of albumen and lime with rubber and then smokes or tans it to improve its quality.

The piperidine product mentioned in the German patent No. 265,221 and English patent No. 11,530, of 1913, has appeared on the English market under the name of "Bayer Patent Accelerator," and it is claimed that the addition of a very small percentage to any rubber mixing accelerates vulcanization so that it can be carried out in from one-quarter to one-sixth the usual time. Samples were exhibited at the recent exhibition in London, and it is said to have been extensively taken up in France.

A consideration of the above references showing the use of organic nitrogen, usually in the forms of amines or like compounds, indicates that this form of nitrogen has some catalytic influence in hastening the combination of rubber and sulphur, and also has some influence in polymerizing the rubber itself. The field seems to be yet open for research as to the best reagent to apply from the wide variety available and the best methods of applying.

With the use of large quantities of plantation rubbers, which are known to be deficient in both proteins and other nitrogen compounds, and which are recognized as being much slower in vulcanization than Para, it would seem that it is desirable to determine on some substance like the above which will act as a hastener. Aside from any technically improved results which are to be anticipated, it is evident that any hastening of the process of vulcanization will result in great economies in manufacture.

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

The Editor's Book Table.

THE RUBBER INDUSTRY IN BRAZIL AND THE ORIENT. BY C. E. AKERS. London, 1914. Methuen & Co., Limited. [Cloth, 320 pages, with 26 illustrations. Price, 6s. net.]

THE official report of the "Akers Rubber Commission" of 1912-13 was dealt with by THE INDIA RUBBER WORLD in May, 1913 (page 417). It will be recalled that this commission (appointed by the Booth Steamship Co. and other prominent shipping interests) had two sections, dealing successively with the Orient and the Amazon. Mr. C. E. Akers, who formed part of each division, has now formulated his own report on the entire subject of "The Rubber Industry in Brazil and the Orient."

While the broad features of the Amazon rubber industry, as described in the first nine chapters of this volume, are familiar to most rubber men, the tenth chapter, comparing the Brazilian and Oriental rubber industries, is of special interest at the present time.

BRAZIL.

In the Orient there is an abundant and cheap supply of methodical plantation labor, while in Brazil the high wage rate prohibits the use of a collective force, all enterprise being dependent on individual energy, with little or no supervision. No effort is apparently made in that country to aid the growth of the rubber trees or to check pests. The trees are self-sown, only a limited proportion of those germinating coming to maturity in the dense forest shade. According to Eastern methods, the seed is selected and planted in special nurseries, the young trees being afterwards transferred to land prepared with a view to the maximum growth of root and branch.

The planted area in the East may, in the author's opinion, be taken approximately as 1,500,000 acres, containing about 180,000,000 to 200,000,000 trees. In the Amazon valley, he remarks, the acreage of planted trees is of such limited extent as not to affect the general conditions; while there is no reason to suppose the official estimate of 200,000,000 wild trees to be an exaggeration.

Mr. Akers states that the seed sent over by Mr. Wickham was of the white (or weak) description, valued in the Brazilian markets at 20 per cent. less than the black variety, which stands preëminent for the resilient quality of its yield, and which is the species principally grown in the Amazon valley. The rubber tree referred to for comparative purposes is the *Hevea*, as there is only an unimportant quantity of Caucho or *Castilloa* in the East; while the opinion is expressed that within a few years the exportation of that class of rubber from the Amazon valley will be a thing of the past. It constituted only 23.37 per cent. of the Amazon rubber exports of 43,362 tons for the year ending June 30, 1913. Of this grand total 31,362 tons were produced on the upper rivers, including Bolivia and Peru, while 12,000 tons came from the lower Amazon and its tributaries. The production outside the Amazon valley for the period named (chiefly *Manihot* varieties from Ceara and the adjacent states) was 4,000 tons; the total Brazilian crop being thus for the rubber year 1913 about 47,000 tons, or 40 per cent. of the world's production.

As to rainfall, the Amazon valley and the Malay Peninsula each get about 100 inches annually, but in the latter the distribution is more uniform than in Brazil, where there is a regular dry season from June to October. Owing to the comparative absence of moisture in Brazil the heat, however, is less trying than in the East. With the aid of careful cultivation the rubber tree is successfully planted in the East in many different soils, avoiding undrained swampy lands or those exposed to strong prevailing winds.

The average daily wage rate (without rations) in the East is under 1*s.* (24.33 cents) for able-bodied men. In the rubber districts of Brazil the average is 6*s.* 8*d.* ($1.62) per day, which, including rations, equals about $2 per day. The rubber collector receives no money wages, but is a partner on equal shares with the estate owner, being entitled to 50 per cent. of the rubber he delivers during the season. In the East the coolie lives on rice and curry at a cost of a few pence per day; while in the Amazon valley the laborers cannot purchase the daily necessities of life for less than 2*s.* 6*d.* (60.81 cents) per day. Responsible posts, as superintendents, can be filled in the East for moderate salaries, much below those demanded in Brazil for like services.

A GIANT SPECIMEN OF *Hevea Brasiliensis*, MIRARY, RIVER MADEIRA. GIRTH AT 3 FEET FROM THE GROUND, 266 INCHES.

Rubber trees begin to produce in the East when four years old, while in Brazil twelve or fifteen years is the period when they are considered fit for tapping without injurious effects. In the East a rubber tree 75 feet high, with a girth of 100 inches at 3 feet from the ground, is thought a giant, while in the Amazon valley one of 150 feet in height with 200 inches girth is not considered remarkable.

Transport to the port of shipment in the East is easy and inexpensive whether the production be in Ceylon, Malaya, Java or Sumatra. In the Amazon valley the rubber properties are mostly situated on rivers far distant from Manãos or Parã, and the cost of steamer freight to one or the other port is a considerable item in the cost of production.

Two comparative calculations show the respective inclusive costs of Malayan and Brazilian rubber delivered in Europe as respectively 1*s.* 10*d.* (44.60 cents) and 2*s.* 4¼*d.* (57.27 cents) per pound. The Malayan quotation dates from 1912, since which the cost of production has been in some cases reduced, while the Brazilian calculation is of 1913.

Regarding future costs, Mr. Akers quotes an estimate to the effect that within five years, with increased yields and reduced percentage of weeding expenses, an average cost of 1*s.* 3*d.* (30.41 cents) will be reached by Malayan plantations. He sees no reason to doubt the attainment of this figure, which has become an accomplished fact on many Ceylon properties.

THE ORIENT.

The section more specially devoted to the Orient deals in the first place with Ceylon, the exports from which source were 10,686 tons in 1913, and are estimated at 15,000 for 1914; while the opinion is expressed that the additional large areas then coming into bearing will bring the total for 1915 to over 25,000 tons. With steady increases during the three following years, the Ceylon production for 1919 is expected to be 45,000 tons, with prospects of further development. The area now planted is shown as 234,000 acres, which will be slightly increased during the next five years, reaching 250,000 acres in 1919.

In the Malayan peninsula an area of 685,000 acres was under rubber in 1913, which produced 35,352 tons. With a view to further planting, 260,000 acres suitable for rubber cultivation have been alienated under permanent title. It is anticipated that a large portion of this land will be planted within the next few years. A number of useful calculations show the practical side of cost estimates, while the labor question is fully dealt with.

In Sumatra there was only a limited development of the eastern section until 1890. Access to the inland districts was forbidden until 1899, when tobacco and coffee planting were established in the province of Deli; since which time rubber and Robusta coffee have largely replaced Liberian coffee. Owing to the slowness of Dutch government procedure in the matter of new enterprises, the rubber planting industry has been in Sumatra largely confined to the districts already possessing transport facilities in connection with tobacco and coffee.

Estimates vary as to the area under rubber in Sumatra, the most reliable showing 167,000 acres (with 16,733,470 trees) for 1911, 227,000 acres for 1912 and 237,000 acres for 1913. The tendency during the last five years has been to open larger plantations than formerly; a notable case being that of the Holland-American Co. at Asahan, where the 35,000 acres planted during the last four years are, according to prospective arrangements, to be increased to 50,000. Millions of acres available for the extension of rubber planting remain untouched in Sumatra. One point worth notice is the opportunity afforded of planting rubber during the seven years of rest given tobacco lands between crops. The trees develop rapidly in both high and low lands, while the rainfall is variable.

The Sumatra rubber industry originated from the severe depression in Brazilian coffee. Planters were encouraged by the results attained in the Malay Peninsula to interplant rubber with coffee. A certain number of tobacco growers also co-operated. An estimate of cost up to the time of sale in Europe is 12.95*d.* sterling (26.25 cents). This compares with the price of prospectively 30.41 cents from Malaya. Estimates of future production range from 8,000 tons in 1914 to 44,000 tons in 1919, with only a slightly increased planted area.

In Java, the rubber estates are largely in the southern portion of the island, that section being for climatic reasons preferred to the northern district. The temperature is very even, with a good average rainfall in most districts. Statistics for 1913 show 240,000 acres under rubber, being an increase of 82,000 acres since 1911.

There is a great scarcity in Java of experienced managers and superintendents for rubber estates, particularly of those acquainted with the Dutch, Malay, Sundanese and Javanese languages. Exports of rubber from Java have been: 1911, 99 tons; 1912, 530 tons; 1913, 1,760 tons. Estimates for 1914 to 1921 range from 10,650 to 46,000 tons.

Such are a few of the salient points of interest in Mr. Akers' book, largely drawn from personal experience and treating in very readable form the question of "East vs. West," as affecting rubber cultivation.

The accepted authority on South American rubber—"The Rubber Country of the Amazon," by Henry C. Pearson.

THE DISEASES OF TROPICAL PLANTS. By Melville Thurston Cook, Ph. D., Professor of Plant Pathology, Rutgers College, formerly chief of the Department of Plant Pathology for the Republic of Cuba. MacMillans. [8vo., 317 pp.]

This volume is an excellent illustration of what practical books should be. It is written modestly but with a simplicity and lucidity which come only from a writer who knows the subject he undertakes to treat. Without tiresome details he presents the groundwork of the study, showing the nature and functions of the living plant and the way in which those functions may be interrupted and the plant destroyed. The chief features of the various classes of organisms producing plant diseases are then described and the means of fighting them are considered. For instance, bacteria, inconceivably minute and circulating through the juices of a plant, are not disturbed by sprays which would destroy surface-growing fungi. It is an old proverb that to be able to see a danger robs it of half its terrors. No planter can deal with a disease when ignorant of the nature of that disease. The day of empirical procedure is past in agriculture as well as in medicine, and the planter who attempts to run his business without a knowledge of plant pathology is much like an engineer who runs a train without a knowledge of signals.

After giving this groundwork, Professor Cook takes up in turn the specific diseases of a great number of tropical plants, including all the staples. He considers the cankers produced by *Nectria*, the most important of rubber enemies. This is a fungus which acts in a way exactly similar to the chestnut blight of the eastern United States. That is, it finds entrance to a wound in the plant and, having established a foothold, attacks the cambium layer. This, of course, is fatal. A feature upon which too much stress cannot be laid, is that it is also saprophytic, multiplying in the dead tissues of the plant it has destroyed. The only way it can be controlled is to cut and burn every particle of the diseased portions. Certain cankers are common to both coffee and rubber, so it is recommended that rubber plantations be not directly established on worn-out coffee lands. The *Fomes semitostus* is likewise a fungus disease, attacking the roots of *Hevea*. In this case it is necessary to burn the whole tree, roots and all, while the disease spreads, mushroom like, through the soil. The author's general conclusions are that strict quarantine should be maintained, that planters should be constantly on their guard for infection and take prompt and drastic action when it is discovered. He also recommends that the chances of disease be localized by cutting *Hevea* plantations into small blocks, divided by plantings of *Ficus elastica*. The illustrations are well printed and informing and the whole work is interesting and well written.

RUBBER: ITS SOURCES, CULTIVATION AND PREPARATION. (The Imperial Institute Series of Handbooks.) By Harold Brown, 1914; John Murray. [Cloth, 8vo., 245 pages, 12 plates. Price 6*s.*]

Of the making of books there is no end, and of handbooks this is no exception. This latest handbook of rubber carries out the idea that is expected of a work of its class—a vast amount of succinctly stated facts packed within reasonable space and brought down to date so far as possible. It is stated to be a work for both the student and the practical rubber man, and both will find in it much of interest. For the former the story will seem to be told with a completeness which leaves nothing to be desired; while the latter, knowing how impossible is the complete treatment of so vast a subject within so few pages, will recognize, at the same time, that the important facts regarding the raw material have been given with a great deal of regard for just proportion. As might be expected of a work published under the auspices of a patriotic British society, the rubber-producing countries outside of the British colonies receive little mention beyond the statistical tables, but these are

fairly and fully given. A further impress of its origin is also shown in the fact that the British colonies in Africa receive a whole chapter, while Malaya and Ceylon, which require no booming, figure only incidentally in the treatment of the subject.

The story stops with the production of the crude gum, which is not followed through the factory to the lumberman's boot, to the dump, the reclaiming plant, to the tire of the traveler's car, to the reclaimer's again and on to that mysterious region as yet not reached; but, as the story deals with rubber and not with its manufacture, it may be said to be fully told. Every plant which is a source of commercial, as distinguished from laboratory, rubber is fully treated and many curiously interesting points are brought out. Thus it is shown that *Hevea* has no preference for swamps but likes a hot climate and constant and abundant rainfall. This seems to explain its great success in the Malay Peninsula, where the waters above the firmament seem to be in permanently unstable equilibrium and a hundred inches of rain come down every season. *Castilloa*, it is noted, not only gives constantly larger returns as the tree matures, but the proportion of resin, high in the young trees, rapidly diminishes as the trees grow older. The statistics of yield seem to prove that those who have plantations of *Castilloa* already in the ground should not be too pessimistic as to the future of their investment.

In *Manihot*, as in *Hevea* and *Castilloa*, there are rubber-producing species other than the ones best known, and it is possible that *Manihot Glaziovii* may prove less useful than one or more of the other species. The African rubbers are treated at great length and the reader who yearns to know all about "fair red niggers," "white soaked niggers" and "pinky niggers" can learn of them in these pages. The chemistry of rubber is briefly but interestingly and adequately treated. In bringing the work down to date, not only are the figures of production and acreage given, but also the latest experimental conclusions about methods and profits of culture.

ANNALS OF THE MISSOURI BOTANICAL GARDEN, ST. LOUIS.

Now that science forms part of a liberal education, there is an increasing number of persons who can appreciate the above named "Annals," with its varied contents, all the subjects having a relation to botany in one form or another. Thus, Jacob R. Schramm leads off with a contribution dealing with elementary nitrogen in algae and in other forms. In a succeeding paper G. L. Foster takes up the question of the sources of nitrogen for marine algae. Five other papers by eminent authorities complete the contents of this number, which is of marked interest to botanists and other scientists.

ROYAL COLONIAL INSTITUTE YEAR BOOK.

Forty-six years have passed since the establishment, in 1868, of the Royal Colonial Institute, following closely upon the foundation of the Dominion of Canada. The object of the Institute was the propagation of information in Great Britain and the colonies regarding the latest and most authoritative facts as to the British Empire. Starting with 174 members, it had by 1880 attained a membership of more than 1,100. The comprehensive year book for 1914 shows about 2,000 resident and about 7,000 non-resident fellows. The proceedings of the past year are reported in detail, statistics of the British Colonies forming an appropriate conclusion to the year-book.

IMPERIAL INSTITUTE BULLETIN.

The second quarterly Bulletin of the Imperial Institute, London, for the year 1914—April to June—deals among other subjects with recent investigations at the Institute on Nyasaland soils, flax from East Africa, and copal from British West Africa. Another colonial possibility receives attention in an article by Mr. W. Small, Government Botanist of Uganda, on "Coffee Cultivation in Uganda," while "Tin Resources of Malaya and India" treats of that industry, to be supplemented by a later article on "Tin in Australia and Africa," thus covering the whole ground.

MONOGRAPHS ON RUBBER MANUFACTURE.

In a series of eight monographs the "Gummi-Zeitung" is publishing handbooks to the principal sections of the rubber industry, the subjects including the whole range of practical rubber technology. From the first two booklets, issued by the "Union Deutsche Verlagsgesellschaft," of Berlin, the scope of the work is to be seen. If carried out in the manner intended, it will form a valuable addition to current rubber literature.

Handbook No. 1 deals with "Machines for the Manufacture of Rubber Goods," the authors being Herr Taubert (engineer) and Dr. Fritz Frank. In its 56 pages, with 52 illustrations, the subject is comprehensively treated, precedence being given to a general review of power installations, followed by a description of washing, drying and mixing plants; after which come hose-making, spreading and other machines.

Next in order are vulcanizing machines (furnaces, presses and molds), as well as machinès for the manufacture of hard rubber, for vulcanizing sheet rubber and for making molded seamless articles.

Among the machinery specially referred to are hydraulic pumps, used in pressing and vulcanization in various dimensions, with and without accumulators, as well as winding apparatus. With an average of nearly one illustration to every page, this first handbook covers a wide field, and indicates a large amount of painstaking work on the part of the authors.

The second handbook received, "Die Fabrikation des Bereifungs Materials," by Herr E. Regler (engineer) and Dr. Fritz Frank, handles in similar detail the process of tire manufacture, under the two broad divisions of solid and pneumatic tires, containing 72 pages with 76 illustrations. In the first place the use of solid tires for horse-drawn vehicles is dealt with, followed by a discussion of their employment on motor trucks. The subjects of vulcanizing them on a steel band and of fixing a steel band on rubber, terminate the consideration of solid tires, which occupies a quarter of the booklet.

Under the heading of pneumatic tires are eight sections, including bicycle tires, pneumatic tires for aeroplanes, pneumatic tires for motor trucks with steel rivets and with leather anti-skid devices, air-tubes for automobile tires, as well as Palmer cord tires and other special constructions. In the concluding chapters the testing and treatment of tires are dealt with, a special description being given of repair shop machinery, equipment and operation.

Improved roads have been to a great extent due to the use of solid tires on motor trucks, such highways being a primary condition of successful tire operation. These brief extracts will serve to indicate the value of the two booklets issued and the prospective interest to rubber experts of the other handbooks still to appear.

A BOOK ON DUTCH GUIANA.

THE INDIA RUBBER WORLD has received a dozen copies of a little book of sixty pages entitled "Netherland Guiana, South America, Its Development, Resources and Possibilities," by James L. O'Connor of Paramaribo. This book was prepared chiefly for use at the recent London Exhibition. It gives an ample description of the resources of Dutch Guiana and has a number of pertinent illustrations. Anyone who is particularly interested in the subject may on application to this office have a copy of this book gratis, as long as the small quantity lasts.

THE GARDENS' BULLETIN—STRAITS SETTLEMENTS.

In the June 20 issue of "The Gardens' Bulletin," published at Singapore "as material becomes available," are grouped items of interest to the rubber industry, as well as information regarding other articles exported from the Straits. Of the nine rubber trees planted in the Botanic Gardens, Singapore, in 1877—some of

which were tapped as early as 1889—only five now remain. Tree No. 2, which has just died, had been tapped at intervals up to January 30, 1914. It measured 10 feet, 5 inches in circumference.

Another Para rubber tree, now 28 years old, has been tapped yearly since 1896, the yield ranging from 1 pound in 1897 to 13 pounds in 1913.

NEW TRADE PUBLICATIONS.

A NEW SERIES OF BOSTON WOVEN HOSE AND RUBBER FOLDERS.

THE Boston Woven Hose & Rubber Co. has ready for distribution a set of nine folders, each artistically descriptive of a particular brand of the company's well known rubber belting. Five of the trade names adopted by this company—Bison, Tiger, Ram, Aurochs and Bull Dog—lend themselves very readily to purposes of illustration, a fact which has been taken due advantage of in the design of this new literature. Between the "Bison" brand for light work and the "Aurochs" for carrying heavy loads of sharp ore, the company makes a wide variety of beltings intended for general and special purposes, including the "Bay State" for use in oil fields, the "Congress" for lumber mill service, and "Service" belting for all-round purposes. The "Bull Dog," illustrated as "always looking for a hard proposition" is described as "the best we have to offer," while the "Helmet" brand is mentioned as "our best stitched belt, especially designed for hard service in wet places." This company, whose works are located at Cambridge and Plymouth, Massachusetts, has offices in ten of the principal cities of the United States—its home office being situated in Boston—and has warehouses in Chicago and Pittsburgh.

THE DERBY CALENDAR.

The Derby Rubber Co., whose factory for the reclaiming of rubber is located at Derby, Connecticut, is favoring its friends with monthly calendars especially pleasing in appearance. The August number depicts against a beautiful background of hill and sky two sportsmen in a frail canoe shooting some particularly dangerous looking rapids.

THE DOMINION.

The semi-monthly publication "The Dominion," published by the Canadian Consolidated Rubber Co., Ltd., of Montreal, Quebec, contains in interesting form accounts of the activities of that company and its associated branches, known as the Dominion Rubber System. The issue of August 1 is devoted largely to an account of the first convention of the Dominion Rubber System, held the week commencing July 20, which brought together representatives from almost every far point of the Dominion. After a helpful, instructive and inspiring three days' session in Montreal, an additional two days' convention was held in Berlin, Ontario, where the Dominion Tire Co., Ltd., is located. Each number contains also some items of general interest to the trade, that of August 15 devoting space to an article on the situation in Canadian manufactures caused by the war.

"WORK DONE"—INDUSTRIAL EDITION.

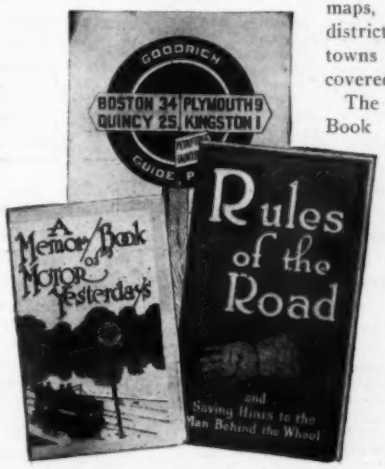
In the 50-page booklet recently issued by Westinghouse, Church, Kerr & Co., the principal feature is the record of "Work Done" by that important firm of engineers and constructors. The services rendered manufacturers have been of a varied character, from those of an advisory nature to the design, supervision and construction of entire plants, with the aid of men trained in every branch of engineering.

Supplementing these general explanations are detailed accounts (with about 50 illustrations) of the work carried out in some 15 of the many plants which have at various times availed themselves of the firm's services. These plants include half a dozen prominent rubber factories, among others the Federal Rubber Manufacturing Co., of Cudahy, Wisconsin, of which six interior views are shown.

The booklet affords a comprehensive idea of what this firm has done and is prepared to do for the guidance of manufacturers in the solution of the problems by which they are confronted as to construction and installation.

GOODRICH ROUTE BOOKS.

A selection of Goodrich Route Books, applicable to the eastern part of the United States, has come to hand from the touring bureau of The B. F. Goodrich Co., Akron. These booklets are remarkably complete, including a large number of maps, showing both country districts and the principal towns on the various routes covered.


GOODRICH
BOSTON 34 PLYMOUTH 9
QUINCY 25 KINGSTON 1
A Memory Book of Motor Yesterdays
Rules of the Road
and Saving Hints to the Man Behind the Wheel

The Long Island Route Book includes, besides a certain number of local maps, 8 maps showing in sections the coast from Brighton Beach to Easthampton, with full directions for tourists on 21 routes in various parts of Long Island. Another booklet is devoted to New England tours, covering 73 routes between Portland, Boston and New York, as well as adjacent parts of New England. This booklet likewise contains a number of maps.

A third guide book, completing the eastern section, deals with New Jersey, showing 60 routes to points of interest, in many cases illustrated by maps.

Frequent reference is made to the "Road Marker Guide Posting" work of the company, which forms such a valuable feature of its utility.

Similar works to the above are now ready, embracing routes in many parts of the west, while others are in preparation. The Goodrich service is thus being arranged to cover the entire continent.

"Rules of the Road" forms an interesting and valuable adjunct to the literature lately received.

RUBBER TIRES FOR STREET CARS.

At the recent session of the Tramways Association of Great Britain in Newcastle one of the speakers suggested the introduction of rubber or some other silent material for tires to street cars.

The speaker contended that a properly designed tire for street cars would exceed the life of tires on motor buses and motor wagons, on which a life of 20,000 miles and over was common; that the wear and tear on the rails would be reduced; that the cost of maintenance would be largely eliminated, and that the corrugation problem would be solved.

The question of doing away with noise and vibration, it was contended, was a strong argument in favor of rubber tires. A higher rate of speed could also be attained, which the speaker placed at 20 miles an hour.

American wire wheels with rubber tires are beginning to compete seriously with Japanese wooden wheels for use on the better class of rickshaws in Ceylon.

Mr. Robert F. Grisar, son of Mr. Emile Grisar and grandson of Mr. Frédéric Delvaux, a member of the Chamber of Deputies, was married on July 19 to Miss Marguerite Good, of Paris.

Official India Rubber Statistics for the United States.

IMPORTS OF RUBBER AND MANUFACTURES OF.

	June				Twelve Months Ending June					
	1913.		1914.		1912.		1913.		1914.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
India rubber, etc., and substitutes for, and manufactures of:										
Unmanufactured—										
Balata .....pounds..free	27,681	$15,815	106,295	$61,432	1,517,066	$984,012	1,318,598	$766,772	1,533,024	$793,126
Guayule gum	657,883	312,445	59,910	12,457	14,238,625	6,463,787	10,218,191	4,345,088	1,475,804	607,076
Gutta-jelutong	2,957,494	150,411	1,477,881	63,549	48,795,268	2,255,050	45,345,338	2,174,441	24,926,571	1,155,402
Gutta-percha	65,352	21,614	176,052	34,758	1,204,406	225,797	480,853	167,313	1,846,109	323,567
India rubber	8,917,928	6,232,094	9,428,700	4,898,062	110,210,173	93,013,255	113,384,359	90,170,316	131,995,742	71,219,851
India-rubber scrap or refuse, fit only for remanufacture	3,885,632	358,994	2,596,809	174,073	26,293,192	2,095,605	43,385,456	3,709,238	25,958,261	2,063,198
Total unmanufactured.	.....	$7,091,373	.....	$5,244,331	.....	$105,037,506	.....	$101,333,168	.....	$76,162,220
Manufactures of—										
Gutta-percha .....dutiable	.....	$1,012	.....	$4,174	.....	$41,098	.....	$77,300	.....	$42,023
India rubber ..... "	.....	98,313	.....	153,601	.....	874,736	.....	1,217,236	.....	1,517,789
Total manufactures of.	.....	$99,325	.....	$157,775	.....	$915,834	.....	$1,294,536	.....	$1,559,812
Substitutes, elasticon, and similar .....dutiable	.....	$7,407	.....	$7,424	.....	$87,328	.....	$97,452	.....	$87,642

IMPORTS OF CRUDE RUBBER BY COUNTRIES.

From:										
Belgium .....pounds	434,107	$323,420	565,075	$332,468	6,101,346	$6,011,823	5,917,440	$5,412,395	10,978,753	$6,462,760
France	90,873	63,495	49,476	20,880	4,139,109	3,820,294	2,968,232	2,584,677	2,629,287	1,124,629
Germany	774,352	469,563	477,789	253,054	8,820,516	6,889,740	7,790,742	5,942,371	7,079,260	3,614,510
Portugal	.....	.....	22,118	8,161	1,449,790	963,516	873,249	642,304	556,560	177,687
United Kingdom	3,623,352	3,111,439	3,860,538	2,249,110	29,728,994	31,544,048	34,164,908	33,586,808	48,279,674	31,152,336
Central American States and British Honduras	39,831	27,040	49,219	27,385	1,390,555	992,106	989,772	661,001	565,487	297,849
Mexico	133,847	103,458	46,659	26,442	2,226,541	1,602,046	2,033,791	1,335,927	640,449	333,327
Brazil	2,805,335	1,309,606	2,368,526	880,534	46,762,744	31,888,425	43,518,861	25,905,641	40,641,305	16,319,048
Other South America.....	142,530	83,460	85,991	33,945	2,857,173	2,077,745	2,267,050	1,630,608	1,845,422	806,888
East Indies	812,286	695,290	1,742,477	975,301	6,338,130	6,840,473	12,255,500	11,888,553	16,597,105	9,675,709
Other countries	61,415	45,323	160,832	90,782	395,275	383,039	604,814	580,031	2,182,441	1,255,108
Total	8,917,928	$6,232,094	9,428,700	$4,898,062	110,210,173	$93,013,255	113,384,359	$90,170,316	131,995,742	$71,219,851

EXPORTS OF AMERICAN RUBBER GOODS.

India rubber, manufactures of:										
Scrap and old.....pounds	691,280	$94,519	597,459	$65,342	7,336,984	$780,188	7,269,465	$880,442	6,207,678	$598,287
Reclaimed	285,435	48,952	681,204	94,599	5,397,806	875,501	5,413,247	932,904	5,583,860	834,440
Belting, hose and packing...	.....	232,484	.....	214,155	.....	2,315,424	.....	2,605,551	.....	2,372,887
Boots and shoes—										
Boots .....pairs	9,699	25,512	14,904	33,709	} 2,545,076	1,502,890	{ 109,528	274,330	101,361	279,206
Shoes	129,464	65,476	82,266	45,583	}		{ 2,231,467	1,163,953	1,634,258	834,289
Tires—										
For automobiles	.....	431,125	.....	453,178	.....	2,657,809	.....	3,943,220	.....	3,505,267
All other	.....	46,079	.....	34,787	.....	546,833	.....	611,458	.....	563,372
All other manufactures of.	.....	323,274	.....	280,752	.....	4,144,273	.....	3,913,036	.....	3,453,472
Total	.....	$1,267,421	.....	$1,222,105	.....	$12,822,918	.....	$14,324,894	.....	$12,441,220

EXPORTS OF AUTOMOBILE TIRES BY COUNTRIES.

To—										
Belgium	.....	$16,470	.....	.....	.....	$51,620	.....	$401,900	.....	$15,730
Germany	.....	28,035	.....	$6,586	.....	1,160	.....	401,196	.....	132,181
England	.....	144,087	.....	192,510	.....	1,177,579	.....	1,125,718	.....	1,503,440
Canada	.....	158,358	.....	168,976	.....	696,433	.....	1,324,459	.....	961,937
Mexico	.....	21,603	.....	2,577	.....	148,480	.....	203,883	.....	111,948
Philippine Islands	.....	17,597	.....	14,040	.....	73,763	.....	100,476	.....	141,205
Other countries	.....	44,975	.....	68,489	.....	508,774	.....	385,588	.....	638,826
Total	.....	$431,125	.....	$453,178	.....	$2,657,809	.....	$3,943,220	.....	$3,505,267

EXPORTS OF FOREIGN MERCHANDISE.

India rubber, etc., and substitutes for, and manufactures of:										
Unmanufactured—										
Balata .....free	.....	.....	.....	.....	12,297	$6,630	118,334	$77,963	223,983	$127,139
Guayule gum	.....	.....	.....	.....	2,250	1,058	83,769	54,669	56,399	22,378
Gutta-jelutong	.....	.....	.....	.....	.....	.....	3,000	163	32,330	2,195
Gutta-percha	.....	.....	.....	.....	2,240	1,700	22,352	2,665	14,319	5,060
India rubber	380,657	$291,357	310,686	176,522	5,272,387	4,476,379	3,747,749	2,398,150		
India rubber scrap or refuse, fit only for remanufacture	40,426	6,064	324	8	87,930	10,723	24,316	2,450		
Total unmanufactured	.....	$297,421	.....	$185,918	.....	$4,622,562	.....	$2,557,372		
Manufactures of—										
Gutta-percha .....dutiable	.....	.....	.....	.....	.....	$27,906	.....	.....		
India rubber	.....	$55	.....	$404	.....	7,973	.....	$7,638		
Substitutes, elasticon and similar.....	.....	.....	.....	.....	.....	559	.....	.....		

COMMERCE OF NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

Shipments from Atlantic Coast Ports (Including Porto Rico) to Pacific Coast Ports (Including Hawaii).

	June, 1914. Via Isthmus of Panama. Quantity.	June, 1914. Via Isthmus of Panama. Value.	June, 1914. Via Isthmus of Tehuantepec. Quantity.	June, 1914. Via Isthmus of Tehuantepec. Value.	Twelve Months Ending June, 1914. Via Isthmus of Panama. Quantity.	Twelve Months Ending June, 1914. Via Isthmus of Panama. Value.	Twelve Months Ending June, 1914. Via Isthmus of Tehuantepec. Quantity.	Twelve Months Ending June, 1914. Via Isthmus of Tehuantepec. Value.
India rubber, manufactures of	.....	$5,893	.....	.....	.....	$177,215	.....	$723,093

Shipments from Pacific Coast Ports (Including Hawaii) to Atlantic Coast Ports (Including Porto Rico).

India-rubber scrap	.....	$17,167	.....	.....	.....	$194,376	.....	$139,008

TO ALASKA.

	June 1913. Quantity.	June 1913. Value.	June 1914. Quantity.	June 1914. Value.	Twelve Months Ending June 1912. Quantity.	Twelve Months Ending June 1912. Value.	Twelve Months Ending June 1913. Quantity.	Twelve Months Ending June 1913. Value.	Twelve Months Ending June 1914. Quantity.	Twelve Months Ending June 1914. Value.
India rubber, manufactures of:										
Belting, hose and packing	.....	$21,500	.....	$15,474	.....	$86,634	.....	$86,629	.....	$110,545
Boots and shoes.....*pairs*	9,420	46,316	5,656	19,516	51,904	181,505	56,944	196,731	55,476	174,033
Tires	.....	1,078	.....	71	.....	1,577	.....	2,147	.....	2,762
All other	.....	3,780	.....	2,910	.....	21,890	.....	30,416	.....	28,438
Total	.....	$72,674	.....	$37,971	.....	$291,606	.....	$315,923	.....	$315,778

TO HAWAII.

India rubber, manufactures of:										
Belting, hose and packing	.....	$6,267	.....	$2,364	.....	$67,550	.....	$78,550	.....	$60,706
Boots and shoes.....*pairs*	84	50	313	314	10,871	9,699	10,017	9,147	7,990	8,205
Tires—										
For automobiles	.....	22,889	.....	33,740	.....	246,607	.....	346,606	.....	357,987
All other	.....	3,490	.....	3,874	.....	8,418	.....	33,457	.....	53,196
All other	.....	4,099	.....	2,012	.....	67,278	.....	77,525	.....	50,159
Total	.....	$36,795	.....	$42,304	.....	$399,552	.....	$545,285	.....	$530,253

FROM HAWAII.

India rubber, crude	.....	.....	.....	.....	3,182	$3,811	6,233	$5,993	3,900	$2,743

TO PORTO RICO.

India rubber, manufactures of:										
Belting, hose and packing	.....	$724	.....	$1,876	.....	$19,485	.....	$31,740	.....	$27,839
Boots and shoes.....*pairs*	30	61	70	67	1,519	1,198	1,357	1,274	526	370
Tires—										
For automobiles	.....	13,810	.....	27,953	.....	150,535	.....	241,714	.....	296,201
All other	.....	1,052	.....	2,211	.....	77,600	.....	51,277	.....	44,330
All other	.....	3,593	.....	2,200	.....	93,226	.....	71,633	.....	37,517
Total	.....	$19,240	.....	$34,307	.....	$342,044	.....	$397,638	.....	$406,257

TO PHILIPPINE ISLANDS.

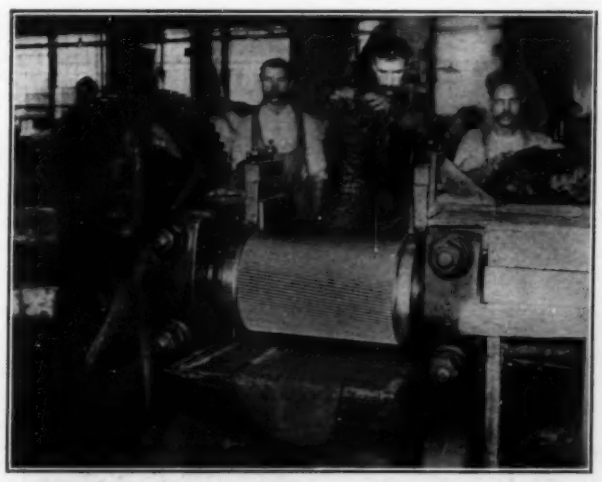
India rubber, manufactures of:										
Belting, hose and packing	.....	$20,156	.....	$6,800	.....	$93,545	.....	$79,637	.....	$50,944
Boots and shoes.....*pairs*	1,200	640	1,984	3,377	5,485	6,734	6,749	5,866	11,641	12,594
Tires—										
For automobiles	.....	17,597	.....	14,040	.....	73,763	.....	100,476	.....	141,205
All other	.....	4,624	.....	5,880	.....	103,488	.....	37,512	.....	93,801
All other	.....	15,410	.....	7,913	.....	125,782	.....	118,005	.....	123,814
Total	.....	$58,427	.....	$38,010	.....	$403,312	.....	$341,496	.....	$422,358

REMAINING IN WAREHOUSE.

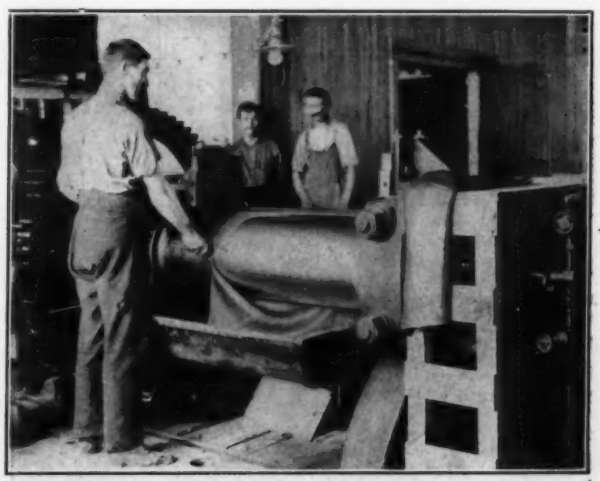
	June 30 1913. Quantity.	June 30 1913. Value.	June 30 1914. Quantity.	June 30 1914. Value.
India rubber, gutta-percha and substitutes:				
Manufactures of—				
Gutta-percha	.....	$226,283	.....	$235,070
India rubber	.....	50,771	.....	92,510
Substitutes, elasticon and similar	.....	.....	.....	606

The Story of Building a Rubber Boot.

TOLD BY PICTURES.



1.—CRACKING THE GUM.



2.—MIXING THE STOCK.

3.—CUTTING OUT THE UPPERS.

4.—RUNNING BOOT HEEL STOCK.

5.—CURING BOOT HEELS.

6.—PUTTING ON LEG LINING.

7.—PUTTING LEG COVER OVER LINING.

8.—LAYING THE SOLE.

The Liability of Railroads for Lost or Damaged Goods.

Every rubber manufacturer is also, to a large extent, a rubber merchant, as he not only manufactures his goods, but he has to find a customer for them when finished, and is obliged to enter the market as a buyer not only for his crude rubber and fabrics, but for all the various other ingredients that go into the construction of his goods, and also for the purchase of machinery and other equipment. So that both in buying and selling he is a constant user of the railroads and will in consequence be interested in this article on railroad liability just as much as if he were a merchant pure and simple. The jobber of rubber goods is a merchant pure and simple, and therefore the laws governing transportation are to him of vital importance; for with jobbers generally—except possibly a few in the very large cities—the railroads must be used both in getting and in distributing their stocks. What they can expect and what they can exact from the railroads, therefore, are matters of the first importance.

THE liability of railroads and other common carriers for damages for the non-delivery or the delivery in damaged condition of goods committed to their care is a subject of interest to almost every dealer, whether wholesaler or retailer. Every merchant in business uses the railroads as a means of transportation, and almost every one at one time or another will have claims against them, so that some illumination of the legal principles that control such claims may be useful.

In the beginning, the status of the merchant in making claims against a railroad company depends on the way in which he has purchased the goods. As to delivery, merchandise is usually sold in either of two ways. John Jones & Co., jobbers or manufacturers, of New York City, will take an order from James Brown, a retailer in Cincinnati, Ohio, for goods. If the goods are sold delivered in Cincinnati, freight paid, the railroad is the agent of the seller, and if anything is wrong with the shipment—if it is either not delivered at all, or delivered damaged—the buyer's claim is against the seller. In such a case he has nothing whatever to do with the railroad, and should hold the seller responsible for the loss, whatever it may be, for the contract is of course not fulfilled by the seller until the goods are properly delivered. In this case the seller has the claim against the railroad.

In my judgment, however, sales of merchandise are mostly made the other way, i. e., f. o. b. (free on board) the place of sale. In this case John Jones & Co. sell the goods at New York and it is Brown's business to get them transported to Cincinnati. Practically always in such cases, Jones & Co. will actually deliver the goods to the railroad and make all shipping arrangements. In this case the railroad is the agent of the buyer and if anything happens to the goods en route the buyer must look to the railroad. Some retailers not so fair in their business methods as they might be, will arbitrarily seek to hold the seller responsible in such cases, by deducting enough from bills to cover their loss. Even though the seller, for business reasons, should permit this, there is not the slightest legal warrant for it.

In spite of the fact that the seller of goods sold f. o. b., who delivers them to the railroad, is acting simply as the buyer's agent, it is established that the seller in the contract he makes with the railroad will usually bind the buyer. In other words, if the seller accepts from the railroad a bill of lading which contains a limitation of the railroad's liability, the buyer is bound and cannot claim that he did not consent to any such limitation.

It is by these contracts that common carriers give themselves the upper hand over shippers of merchandise and make it extremely difficult to get justice when goods are lost or destroyed. Before the days when railroads had learned how to reduce their liability the matter was controlled by the common law, and a railroad was considered an absolute insurer of goods given it to transport. In those days no ordinary excuse was accepted. If goods were lost or damaged the railroad was compelled to make good the loss, unless it could be shown that it came from the act of God, a public enemy or the negligence of the shipper himself.

Conditions have changed, however, and today practically every railroad and common carrier uses a bill of lading which makes its liability for damage only a fraction of what it formerly was, and what it should be. Under the bill of lading now in general use a railroad can be held responsible only for damage that comes from its negligence, and upon the claimant is usually put the burden of proving the negligence. This is often a very hard thing to do. The railroads have even tried to go further and force on shippers contracts which relieved them of practically all liability, even for the results of their own negligence. In every case, however, the courts have held such contracts void as against public policy.

The acceptance of such a bill of lading by a shipper makes the contract, whether the shipper read or understood it or not.

When a merchant receives merchandise in bad order he is often compelled by the railroads to sign for it in good order before they will deliver it to him. Often he is required to do this before he has even had the chance to examine it and learn its condition. By doing so he loses none of his rights, however, for he will always be permitted to show that he was compelled to give the good-order receipt against his will. If he discovers that the goods are damaged his course is plain, but not always easy. If he has bought the goods f. o. b. and it is incumbent upon himself to make the claim against the road, he should at once file a formal claim for damages. The chance is he will never hear of this again unless he presses it. If he finds he can get nothing out of court, he can begin an action. In order to make out a *prima facie* case (a case good enough to get judgment if not overturned) he needs simply to prove the delivery of the goods to the railroad in good order and their delivery to him in bad order. It is then up to the railroad to show that by reason of the contract in the bill of lading they are not responsible. If the bill of lading relieves the road of all responsibility, except for negligence, the merchant will then have to prove the negligence in order to recover. Sometimes this is comparatively easy, sometimes almost impossible. In such cases negligence is not presumed by the simple occurrence of damage and must be shown, except where the goods are lost entirely. In that case negligence need not be proven; the loss is supposed to be due to the railroad's negligence.

The rule as to what is negligence in these cases is simple: If the railroad failed to use ordinary prudence and care, and as a result the goods were damaged, negligence is made out.

The measure of damages in case judgment is obtained is the market value of the goods at the point of destination, not the point from which they were shipped. To the market value may be added interest, and from the sum of principal and interest the freight charges are to be deducted. The above is the rule where the goods are lost. Where they are simply damaged, the measure is the market value less the fair value of the damaged goods at the point of destination. In

case of damage through unwarranted delay, the measure of damage is the difference between the market value at the point of destination on the day when delivery should have been made and the market value on the day when it was made. This whether the decline which may have occurred was due to a market decline or a deterioration of the goods themselves.

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THE RUBBER DEALER'S PARADISE.

Labrador—Where sealskins are gladly exchanged for rubber boots and coats.

By Felix J. Koch.

"I NOTE in the papers that you are going to Labrador," a friend wrote, "and I'm presuming to make a suggestion: See if some store in your city is closing out an old stock of rubber coats, or drop in on the shoe dealers and see if they have a stock of rubber boots or shoes that they want to get rid of—soiled, out of date, or possibly factory damaged. If they have, buy it and take it along, and trade it in Labrador for furs. I know you'll be thankful for the hint."

My friend was a newspaper correspondent, whose work took him all over the globe. I knew that he had already "done" Labrador and that he knew whereof he affirmed.

I hadn't been on that ten thousand miles of peninsula very long without learning that he was right. Labrador is indeed the cod-fisherman's happy hunting ground. Some freak of nature has caused the old dame to send the cod fish to this bleak, inhospitable shore in schools of such size as to pass all reckoning. The cod from here go to supply the world, well nigh, and without them strict church people in Europe and America would be sadly put to it indeed throughout Lent. Wherefore thirty thousand odd fishermen come, every year, from Newfoundland and Nova Scotia to compete with the miserable "liveyeres"—as the settled inhabitants are termed—in taking the cod.

The Newfoundlanders live in temporary huts erected on the shores, some of which are fairly well equipped.

The simple native Labradorean, born on this coast, never leaves it except to put to sea in a fishing smack. Back from the coast rise the mountains, behind which is an unexplored region. In

LABRADOR FISHERMEN IN THEIR SEAL-SKIN BOOTS.

the winter the native traps a bit in this unknown country, but never farther than points he can see from those coast mountains as he crosses their ridge to come down on the landward side. In the spring he kills the seal on the ice; in the summer he takes to cod fishing. He has never seen a horse, has never used a cart or any form of wheeled vehicle. When he has enough fish they are cured and barreled, and in the fall some "planter" will come up to find him and buy what he has, or rather, barter (for money is to little purpose there); and the man is content.

In the winter he traps and gets beautiful skins, but he knows little of values, so he devotes these to his family needs first, storing what is left till he gets a load, when he goes by dog-team across the frozen fiords to the nearest Hudson Bay trading post. There he arranges for barter, and always gets the worst of it. He has many wants to be filled—powder, ammunition, guns. He needs baking powder, spices, groceries—things that don't abound in Labrador. He wants garments; but most of all he wants a good stout "slicker," as he calls a rubber coat—and he eyes the wonderful rubber boots the company is prepared to trade him. What he would say to the regular fishing boot, with

LABRADOR CHILDREN WEAR SEAL-SKIN BOOTS.

the stiff lower leg and the pliable upper part, in which a man can go to his waist in water and be dry, it is interesting to speculate.

That no one has as yet come up here with a boat load of rubber goods of substantial and serviceable description is a wonder. Seal-skin coats, taken and cured as only a trapper can cure them, would be nothing to the native compared with a rubber coat. He knows how the waves dash over the punt when he rides out to the cod-trap; he knows how rheumatism comes on, as a result of years of such exposure, and he envies the happy Newfoundlanders who have coats, hats and boots of rubber. Of course he hasn't money, but he can barter. If you prefer fish, which you can sell the "planter" or his agent, well and good. If you want furs you can come to conclusions even quicker. He knows furs are the more valuable, but he knows, too, that for him they are easy to get. He knows that in the winter those rubber boots would be extremely handy. He knows the supreme comfort of that rubber coat; and when the chance comes to get one he takes it. He will trade what he has for it and believes he has got by far the best of the bargain.

Some day when I get time I will buy up all the second grade rubber goods I can and set sail for Labrador. Until then, any enterprising dealer is welcome to the suggestion. But perhaps even now some commercial adventurer is planning an invasion of this rubber-man's paradise. Who knows?

MANY AKRON-WILLIAMS TIRE REPAIR VULCANIZERS IN USE.

The sales manager of the Williams Foundry & Machine Co., of Akron, states that thirty tire manufacturers, including practically all the leading tire makers in the United States, are using the Akron-Williams tire repair vulcanizers in their factories, branches and service stations. The Ford Motor Co. recently ordered fourteen A-W plants for their accessory stations.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

ON account of the fluctuation in the price of rubber, uncertainty in the money market and in regard to the demand for rubber goods, quotations have been advanced in many lines, some of the factories raising the price of various goods from five to twenty-five per cent. Several companies have made no advance at all in their prices, and some of the advances made have already been rescinded, so that the impression prevails that within a few weeks prices will be almost normal, not only for the finished product but also for the various raw materials which are received from abroad. It is my belief that most of the Akron factories have a sufficient stock of rubber goods on hand, and also a sufficient supply of raw materials, to run them several months, so that the general market in rubber goods should not be greatly affected, and that as soon as the money market and shipping become regular prices will be lower. I am informed that the shipping of rubber into this country was not stopped except when exchange between this and European countries rose to prohibitive rates. Akron men have said that if the shipments cannot be taken care of they will make an effort to charter their own boats to bring in Brazilian and plantation rubber.

H. S. Firestone says: "A sharp turn of war conditions may quickly relieve the present tie-up of navigation and permit crude rubber shipments to reach us. Here are the facts: Over 60 per cent. of the crude rubber used in the United States comes from the Far East, via the Red Sea and the Mediterranean. No merchant ships are passing through these seas now, and we don't know when they will start, surely not for a while. Shippers could divert the shipments via the Pacific Ocean to our western coast, but this change would require time and we have no word that such a course is under advisement.

"Being shut off from the East, we must look to South America for our supply. Here we find only a few hundred tons in stock, because the Brazilian district has a steady market for all they make during their open season. Just now that country is flooded with torrential rains and the gathering of crude rubber cannot start until October. So we find but little immediate relief there.

"When shipments start to come in from the East, crude rubber prices will probably decline sharply, although it has been reported unofficially that when navigation stopped the plantation owners laid off their men and ceased tapping the trees. This of course would mean a shortage of rubber, but it is my personal opinion that transportation is the main difficulty and that as soon as navigation opens we will find plenty of rubber to supply this country."

* * *

The Adamson Machine Co. is making a large addition to its foundry, and installing machinery in the recent addition to its machine shop, giving improved facilities for heavy work. The plant is exceptionally busy, running day and night.

* * *

The B. F. Goodrich Co., for the first six months of 1914, after making proper allowances for maintenance, depreciation and all outstanding liabilities, showed a net profit of $2,651,200. This, added to December surplus, after deducting the regular April and July dividends on preferred stock, shows undivided profits of $2,307,200. From this the company has appropriated sufficient funds to retire nine hundred thousand dollars par value of preferred stock.

This period's gain of quick assets over current liabilities amounts to $1,628,500. Net profits for the first half of 1914 were greater than for the fiscal year of 1913.

B. G. Work, president of the Goodrich company, who, with his family, has been in Germany, and was marooned by the war, has cabled home assurances of their safety.

It is reported that this company's plant in France, on account of the increased need of tires occasioned by the European war, is running day and night to its utmost capacity.

* * *

The Firestone reclaiming plant is practically completed, and the company is building another addition to its main building.

* * *

The Miller Tire & Rubber Co. has commenced to tear down part of the buildings of the Frantz Body Works and expects to replace them with new ones.

* * *

The Marathon Tire & Rubber Co., which has had an exceptional year, is building an addition to its factory and store buildings at Cuyahoga Falls.

* * *

The Kelly-Springfield Tire Co. has just completed equipment of its new factory building, and the whole factory is running full force.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

AS elsewhere, the rubber trade has been in a very unsettled condition for the past month. The flurry in rubber costs was one factor, and the general uncertainty regarding money rates, foreign exchange and delivery of supplies, added to sudden business depression all along the line, made the first two weeks in August rather exciting ones. Prices of about everything made wholly or partly of rubber were advanced, but at last reports most of these lines were settling back nearly or quite to old rates.

The tire situation was presumably the same here as elsewhere. Prices were advanced ten per cent. by all makers. Some houses allowed their favored customers to cover immediate needs at old prices, while others held rigidly to the advance. As a consequence those first two weeks in August were lively ones, with more than one factory reporting the biggest business in their history.

The sundries manufacturers advanced prices twenty per cent., which had the effect of narrowing trade down to immediate needs of their customers. Along about the twentieth, however, half of the advance was lopped off, though this helped trade but little.

The clothing men are uncertain how their trade will be affected. Most of them have large orders. Those who use imported fabrics are by no means certain they will get the goods they have already ordered, and they are likely to pay pretty high rates to insure delivery. While this may work to their disadvantage, the same causes may prevent the receipt of imported garments and thus by removing competition make a better demand for the finer lines.

In boots and shoes, no advance was made in either terms or prices. The possibility that such action might be taken later, however, caused a rush of orders. The factories, which had closed for the regular summer shut-down for repairs and inventory, are now running, and most of them with enough business to keep them going for eight or ten weeks, and stock enough to enable them to do so.

* * *

The Forsyth Dental Infirmary, which has previously been described in these pages, is expected to be opened for its philanthropic work early next month, and will have a proper setting worthy of the beauty of the building, and what might have been a controversy has been amicably settled. Incidentally, a further evidence is shown of the way money made in the rubber business is donated for the benefit of humanity. A large plot of ground belonging to Ex-Governor Foss, if built up in apartment houses, would hide the frontage and obscure

the light of the infirmary. This land was assessed by the city at $140,600. Mr. Foss was willing to sell at what the land originally cost him, and the taxes and interest since its purchase, in all $168,000. This Mayor Curley was unwilling to pay, and he ordered the seizure of the land by right of eminent domain, the award to be not over $125,000. Before proper legislation to this end was passed, however, the mayor sent a substitute order to the council to buy the land at the assessed value, to which the ex-governor agreed.

Then a surprise was the giving to the city of a piece of property adjoining the Foss land and the infirmary. This plot, with apartment houses upon it, the property of Elizabeth Glendower Evans, is assessed at $48,000. By agreement between Mrs. Evans and Mr. Thomas Forsyth, the apartment houses will be razed, and the land be turned over to the city for park purposes at no expense to the city. This is a most substantial addition to the individual donations for the benefit of humanity by these practical philanthropists.

* * *

The selling agents and traveling salesmen of the Revere Rubber Co. were congregated in Boston the middle of the month, when a four days' business convention was held at the Copley-Plaza Hotel, and plans were mapped out for the coming season's campaign. Some eighty or more salesmen were in attendance at the business conferences, and a much larger number, including several of the officers of the company, were present at the banquet given as a wind-up to the convention. One day was spent in thoroughly inspecting the factory at Chelsea, where the salesmen were given every opportunity of familiarizing themselves with the manufacture of the goods.

Mention was made last month of the remarkable mat exhibited by the Revere Rubber Co. at the Shoe and Leather Market Fair in this city. The mat was composed of a great number of Spring Step rubber heels, and a prize was offered for the nearest guess to the exact number. Naturally this created much interest, and over 1,500 people sent in their guesses or estimates, and these estimates ran from 700 up to 71,000. The exact number was 6,002 heels. The nearest guesses were both made by shoe salesmen, William F. Nye, southern salesman for the Whitcomb Shoe Co., of Haverhilll, and Gordon P. Eager, of Rice & Hutchins. Each guessed 6,001 heels. Under these circumstances the Revere Rubber Co. decided to split the first and second prizes, and sent to each a twenty-dollar gold piece, with a congratulatory letter.

* * *

The Rhody Boot Co., of Providence, manufacturers of leather sole rubber boots and overshoes, will move their business to Rockland, Massachusetts, about the first of September, having secured the factory on North Union street formerly occupied by the Burdette Co. This company is a Rhode Island corporation, with an authorized capital of $50,000. The name will be changed to The South Shore Shoe Co. Its specialties in rubber boots and overshoes have a rubber upper, a vulcanized rubber welt-sole, and an oak or chrome leather outsole sewed by the Goodyear welt process. This enables the boot to be resoled, thus insuring it a much longer life. Besides these specialties, the company will add lines of athletic, outing and school shoes.

* * *

Just as a curiosity, I send you a small advertisement clipped from a Portland, Maine, daily paper. It reads:

JOIN THE CROWD and bring all your coupons, tags, and old rubbers to the Green Stamp Co., 24 Forest avenue. Handsome premiums given in exchange.

The connection between coupons, tags, green stamps and worn-out rubbers seems rather remote. Premiums for scrap rubber, however, may be popular way down east.

* * *

The Danversport Rubber Co. at a recent meeting elected Frederick Barlow president, and A. Barlow treasurer. Mr. A. Barlow, who was the founder of the business, has his office at 79 Milk street. J. W. Kumph is superintendent of the mill at Danversport, where an extensive reclaiming plant is located.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber companies throughout this state are finding that the European situation has caused them more inconvenience than it has caused any other industry, these concerns being among the first to report any ill effects from the Continental war. Most of the local plants have been doing a good business and have found ready sale for their products, which consist of nearly everything that is made of rubber. The great difficulty being experienced by the companies is to secure the necessary supply of crude rubber to conduct their operations.

The Revere Rubber Co., Valley street, Providence, which is owned by the United States Tire Co., posted the following notice on August 6: "Owing to conditions caused by the European situation, which make it difficult for us to get our principal crude material, we are temporarily curtailing our production." The company has been running double time for more than a year, manufacturing automobile tires and rubber thread. The night shift finished out that week and was then stopped, according to Harlow Waite, the general manager of the plant. The day shift has been gradually reduced throughout the works and will be continued on a curtailed schedule until the situation clears, with the possibility, if crude rubber continues to be tied up, of the plant closing entirely.

* * *

The American Wringer Co., of Woonsocket, beginning August 7, went on a five-days schedule in the rubber department, and it is expected to make a general curtailment within a comparatively short time. This step was taken, it was said, on account of the effect of the European war on export trade. By this order approximately 125 men are affected. The concern has a large quantity of rubber on hand, but, it is pointed out, it cannot afford to use it all up in a few months, not knowing how long it may be before it can replenish. The American Wringer Co. does a big export business with Germany and England, besides shipping goods to all parts of the world. To fill immediate orders the company will draw from its surplus stock. If any changes are made necessary along curtailment lines, an announcement to that effect will be made by the company.

* * *

The Bourn Rubber Co., Warren street, which has been having a large run on tennis shoes this year, reports that it has on hand a sufficient stock of crude rubber to last several months.

* * *

LeBaron C. Colt, of Bristol, vice-president of the National India Rubber Co., takes an optimistic view of the situation and in an interview a few days ago said that there was no expectation of the company going short of crude rubber on account of the European war. There is an ample supply, he said, and the possibility of interference with the sources of supply is extremely remote. Mr. Colt stated that the rubber interests anticipated no serious trouble whatever, giving his reasons for this by adding that there are several large supplies of stored rubber in this country, one of which is at the plant of the National India Rubber Co., at Bristol, a quantity sufficient for many months.

Mr. Colt then referred to the great stores of crude material provided by the United States Rubber Co., the parent corporation, which looks after such matters years in advance. But the most important factor of all is the great rubber producing center of Ceylon. Referring to this Mr. Colt says that inasmuch as Ceylon is a British possession, and England being expected to maintain her prestige on the seas, matters in Ceylon will remain undisturbed and the production and distribution of crude rubber will go on without interruption as it has in the past.

* * *

At the Alice and Millville mills of the Woonsocket Rubber

Co. work was resumed on Wednesday, July 29, the plants starting on full time with a nearly full complement. The former employs approximately 1,500 and the Millville plant about 600 hands. It is expected that there will be fairly steady work during the fall and winter, as stocks throughout the country are low and orders are being received in considerable volume.

The Alice mill closed down June 20 and the Millville plant on June 30 for the summer shutdown and for repairs and improvements to the machinery. The management had hoped that conditions would be in such shape that work could be resumed by July 24, but delays caused the reopening to be put off until the later date. Five new magnetic safety clutches were installed during the shut-down at the Alice mill.

* * *

The creditors of the Walpole Tire & Rubber Co. early in the month received a third dividend of four per cent. through a decree entered in the United States District Court at Boston by Judge Dodge. This dividend released about $50,000 to the creditors, making a total of 12 per cent. which they have received from the estate to date. The suspended Atlantic National Bank of this city is one of the large creditors of the defunct company. The Walpole Tire & Rubber Co. was the owner of the Consumers' Rubber Co., of Bristol, which concern is in the hands of Robert A. Emerson, receiver.

The auction sale of the Walpole Tire & Rubber Co., which was to have taken place on August 12, has been indefinitely postponed by order of Federal Judge Dodge, owing to unfavorable financial conditions resulting from the European war. A hearing will be given on September 8, when another date may be set for the sale.

* * *

The factory of the National India Rubber Co. at Bristol is increasing its production as the season advances, and large shipments are being made to different parts of the world, including points in Australia, Japan, the Argentine Republic, Brazil and many places in the West and Middle West. The department for the production of lawn tennis shoes is booming, the present daily output being more than 20,000 pairs. The other departments of the plant, especially those devoted to arctics and gum shoes, are also busy.

The output of rubber shoes is steadily increasing. Recently 250 cases of rubber shoes were shipped from the Bristol factory to São Paulo, Brazil, and another lot almost as large was shipped to Buenos Aires, Argentine Republic. There was also a shipment of rubber shoes from the National company early in the month to Sydney, New South Wales, by way of the Pacific Coast, the lot consisting of twenty-one cases. This department employs a large force and new hands are being engaged to keep up with the orders.

Insulated wire of different sizes is also being shipped in large quantities. One shipment to Chicago recently contained 36,700 pounds. Reels of insulated wire weighing six tons were shipped to Lancaster, New York. This company supplied a considerable quantity of this wire to the Panama Canal.

* * *

The Bourn Rubber Co., of Providence, is well established in the new quarters secured to take the place of the factory destroyed by fire a few months ago. The building now occupied is 200 feet long and approximately 50 feet wide, its capacity being more than double that of the old plant. This company, which within a month from the time of the fire was turning out 80 per cent. of the new capacity, is running full on ten hours per day.

Samuel Norris, secretary of the United States Rubber Co., who is spending the summer at Bristol, accompanied by Mrs. Norris, sailed from New York on July 25 on the steamship "Caledonia" for a visit of several weeks in Scotland.

THE RUBBER TRADE IN CHICAGO.

By Our Regular Correspondent.

THE conditions in the local rubber trade, which were greatly disturbed by the sudden declaration of war in Europe and the beginning of the international conflict, became more settled as the month drew to a close. With all importation threatened in a serious manner, trade and banking circles of this city were in a state bordering on panic for a number of days. Within a short time, however, the situation cleared, and conditions are now normal again.

The trade here is optimistic. The concerns report an excellent business during the past month. A number of big meets have been held, including one at Elgin, and Chicago automobile enthusiasts, taking advantage of the good road conditions, have journeyed down to the nearby town to see the event.

* * *

Belting manufacturers report greater sales for the month than during the corresponding period of last year, with the market for packings equally favorable, while the extent of building operations in this middle western section promises a large demand in mechanical lines. The demand for hose has been normal.

* * *

A new belting concern is soon to enter the local field. It has been incorporated under the name of the McCauley Belting Co., with a capital stock of $10,000, the incorporators being James J. McCauley, S. D. Fink and J. P. Grier, all experienced rubber men well acquainted with the trade in Chicago and vicinity. It is understood that the new firm will locate in the wholesale district, opening within a few weeks, handling not only belting, but a general line of mechanical rubber goods, packings, etc.

NEW MEMBERS OF THE RUBBER CLUB.

At the last meeting of the executive committee of the Rubber Club of America several new members were elected, as follows: Firm members—Mansfield Tire & Rubber Co., Mansfield, Ohio, G. W. Henne, representative; Charles E. Wood, 24 Stone street, New York (Transfer of associate membership). Active members—Albert F. Thalhimer, of the United States Rubber Reclaiming Co., Inc., 30 East Forty-second street, New York; George E. Goodwin, of the United States Rubber Co., 140 Essex street, Boston. Associate members—Raymond E. Drake, of the Avon Sole Co., Avon, Massachusetts; Robert J. Wilkie, Kimball Building, Boston; George W. Martin, of the Jenckes Spinning Co., Pawtucket, Rhode Island; A. Boyd Cornell, of the Empire Rubber & Tire Co., Trenton, New Jersey.

LIQUIDATION OF THE KORNIT COMPANY.

By the decision of the referee in bankruptcy, the creditors of the Kornit Manufacturing Co., against which a petition in involuntary bankruptcy was filed in Newark in August, 1909, will receive only $3,561.03 of the assets of that company, $6,000 of the $9,561.03 salvage going to the company's counsel. This company, as will doubtless be recalled, was incorporated in 1904 under the laws of the State of New Jersey with a capital stock of $500,000. to manufacture an insulating material and hard rubber substitute from the horns and hoofs of cattle. Quarters were secured in Belleville, New Jersey, and a small amount of the product, known as "Kornit," was produced, but a fire destroyed the premises on March 1, 1907, terminating production. The investors, who had put large sums into the enterprise, becoming suspicious, an investigation was instituted which led to the conviction of the principals in the promotion of the company—Charles E. Ellis, president, and Edwin R. Graves, vice-president—on a charge of using the mails with intent to defraud, and both were sentenced to three years in the Federal prison at Atlanta, their terms commencing November 2, 1910.

The Obituary Record.

DEATH OF THE OLDEST RUBBER WORKER IN THE UNITED STATES.

ON the evening of July 23 occurred the death of Mr. Frank de Frate, at Tuckahoe, New York, a man who had enjoyed the distinction for some time of being the oldest rubber worker in the United States and probably, at the time of his death, in the world. He was well along in his 90th year, and for 68 years, with the exception of a few months in the middle of the last century, he had been continuously employed in connection with the Hodgman Rubber Co. He was born in Schoharie, New York, December 23, 1824, and learned the hatter's trade, but when he was 22—in 1846—he became associated with Daniel Hodgman, who then had a rubber factory on Duane street, New York. When, in 1851, this factory was moved to Tuckahoe, Mr. de Frate went with his employer, and with the exception of the few months mentioned above had been continuously and actively at work in the Hodgman factory ever since.

In his younger days he was a man of tremendous physical strength, which fact, in addition to his exemplary habits, accounted for his continued activity in his extreme age. About 12 years ago the officers of the Hodgman company proposed to Mr. de Frate that he should retire on a pension, but he objected strenuously and stated that he wanted no remuneration except for work actually done, so he was permitted to continue, but was allowed to come and go as he chose. He went to the factory regularly and did such work as was assigned him up to two days before his death.

It occasionally happens in the manufacturing plants in England and on the Continent that an employe runs past the 50-year mark, but in the history of American manufacture it certainly is a unique incident where a man is actively associated with a manufacturing company for nearly 70 years.

FRANK DE FRATE.

MR. VAN VLIET LEFT OVER $120,000.

The late Clinton Van Vliet, president of Goodyear's India Rubber Selling Co., who died in Flushing, Long Island, on February 6, left an estate valued at $121,258.81, nearly all of it in stocks and bonds. The entire estate was left to his widow.

EDWIN S. MORRIS.

Edwin S. Morris, treasurer of Mulconroy Co., of Philadelphia, died suddenly at his home in Oak Lane, Pennsylvania, on August 8. He was born in Pughtown, Chester County, Pennsylvania, January 1, 1880. At the outbreak of the Spanish-American war, though he was but 18 years of age, he enlisted in the First Regiment Heavy Artillery and was assigned to the coast defense, being stationed at Fort St. Philip, at the mouth of the Mississippi River. At the close of the war he was honorably discharged and then entered a business college in Norristown, Pennsylvania, where he completed the regular course. He then became associated with the Mulconroy Co., and during the last nine years of his connection with the company he acted as its treasurer.

EDWIN S. MORRIS.

Though a young man, he was widely and most favorably known in the rubber manufacturing trade. In addition to his business activities, he was very prominent in masonic circles and also a member of the Order of Independent Americans and the Independent Order of Odd Fellows. He was a trustee in the Oak Lane Baptist Church and interested in work of that institution.

SUICIDE CAUSED BY A GOLF BALL.

Pain from an injury caused by a golf ball, which bounded from a stone wall and struck him in the eye, and worry over the probable loss of sight as a result of this accident, is believed to have been the cause of the suicide of Austin Hall Ruggles Watson, 72 years old, a prominent New York banker and former merchant. The accident occurred about six weeks ago, on the golf links near his home at Beacon, New York, and the pain, which for three weeks rendered sleep impossible, is supposed to have driven him insane.

John C. Connery, foreman of the wire department of the National India Rubber Co., at Bristol, died at his home at Bristol Neck on August 19, of heart disease, from which he had suffered for several months. He was a native of Bristol and a member of a number of local organizations, including the Modern Woodmen of America and the Engine and Hose company. He was 33 years of age and is survived by his wife and two children.

News of the American Rubber Trade.

DELEGATES TO THE CONVENTION OF THE DOMINION RUBBER SYSTEM.

THE Dominion Rubber System is the name given to The Canadian Consolidated Rubber Co., Limited, and its associate companies. A five days' convention was held from July 21 to 25 (the session for the first three days being held in Montreal, and the last two in Berlin, not far from Montreal), to which delegates were sent from the various interests controlled by the company. Here is a photograph of the major part of these delegates, taken on the steps of the Country Club house, at St. Lambert, a Montreal suburb, whither they went to attend a banquet. The serious aspect of most of the faces in the group is not to be attributed to any disinclination on their part to accommodate the photographer, but rather to the fact that while they were being photographed the banquet was waiting.

DOMINION RUBBER SYSTEM DELEGATES.

The convention, for the most part devoted to business discussions—with the social activities merely incidental—was unanimously voted a great success, and is likely to be repeated from year to year.

NEW YORK RUBBER IMPORTERS TO ORGANIZE.

The rubber importers of New York are taking steps to effect an organization which will be for their mutual benefit. An initial meeting was held on August 12 at the office of Ed. Maurer Co., Inc., when 20 members of the importing trade were present. A second meeting was held at the same place two days later, with an attendance of 28 representatives of importing houses. Five of the number present, namely—Ed. Maurer, W. E. Bruyn, F. L. Henderson, W. T. Baird and W. H. Stiles, were elected as a committee to outline a plan for the proposed association.

RUBBER COMPANY DIVIDEND.

The Plymouth Rubber Co., of Canton, Massachusetts, has declared a quarterly dividend of 1¾ per cent. on its preferred stock, payable September 1 to stockholders of record on August 24.

THE STANDARD "EMAREX" CO. OF CHICAGO.

Mr. George W. Watkinson has sent out a notice under date of September 1 of the incorporation of the Standard "Emarex" Co., with offices at 208 South LaSalle street, Chicago, to take over the "Emarex" business of the Standard Asphalt & Rubber Co. This was done as it was thought desirable to separate this particular business from the other lines in which the latter company is interested.

ALDEN'S SUCCESSORS, LTD.

Alden's Successors, Ltd., formed early in May to take over the London and Liverpool business formerly conducted by A. H. Alden & Co., Ltd., importers and merchants, as well as to control the business of Adelbert H. Alden, Ltd., of Pará and Manáos, have established a branch office at 290 Broadway, New York, to import and deal in crude rubber in the United States and Canada, and have appointed Mr. Frederick W. Dunbar of that address their attorney in fact and manager.

GOODRICH FIRE HOSE USED FOR FIFTEEN YEARS.

A quantity of Goodrich hose purchased in 1899 by a large city in the middle west for its fire department, and which has been in constant service since that time, has recently been turned over to the street cleaners for use in sprinkling the streets—in which department it is giving equally efficient service.

RUBBER COMPANIES AND SAVINGS BANKS LIFE INSURANCE.

The rubber industry of Massachusetts has taken a great interest in the movement to furnish life insurance at cost for the working people. Agencies have been established by the following rubber companies in that state: Tyer Rubber Co., Andover; Hood Rubber Co., Watertown; Revere Rubber Co., Chelsea; Boston Woven Hose & Rubber Co., Cambridge; American Rubber Co., Cambridge, and Boston Rubber Shoe Co., Malden.

These companies collect the premiums for their employes and forward them without expense to the insurance departments of the savings banks.

HENRY J. DOUGHTY.

Henry J. Doughty, active, genial and vigorous, still invents machines that solve some of the problems which vex the rubber manufacturers. This well known inventor's career began 65 years ago, in Topsham, Maine. His first job was that of blacksmith's helper. After six months of this he went to Ashland, Massachusetts, to learn the business of shoe-last making. From there he went to Worcester, and a year later became in a measure a rubber man by joining the forces of the Cox Last Works in Malden. He was with this concern nearly twenty years before he was discovered by Joseph Banigan, who induced him to come to Providence to design and build machinery for a molded rubber shoe. This was perfected in 1886, and was

HENRY J. DOUGHTY.

the well-known "Marvel" shoe. At the same time Mr. Doughty invented the ingenious presses that made and vulcanized the miniature rubber boots and shoes.

Later he invented a quick-curing press, a collapsible tread press and a tube-making machine—all for bicycle tires. These machines—that is, those adapted for double tube tires and inner tubes—were purchased by the English Dunlop company, and are still used in their factories. He has invented also a number of remarkable machines in the rubber footwear line.

At the present time Mr. Doughty is the active head of the Doughty Tire Co., and is hard at work on machinery connected with the motor tire industry. Indeed this machinery is practically perfected. It consists of a loom that weaves a special fabric in strips with heavy selvedge and open center. This is passed through a new type of friction calender, and poured hot round the tire core. At the same time wire is wound into the bead and the bead finished. The tread strip is then added. The making of the carcass in this way takes five minutes. For curing, a new type of collapsible head vulcanizing press is a part of the Doughty process. This, through its heated platens and its heated cores inside of the carcass, completes the cure in 25 minutes. Tires made by this process have been severely tested and stand up wonderfully. To handle the business end of the matter Mr. Doughty has formed the Doughty Tire Co., in which he holds a controlling interest. The foreign rights are in the hands of a prominent European rubber machinery company.

PERSONAL MENTION.

Mr. Clarence H. Loewenthal, secretary of the United States Rubber Reclaiming Co., of New York, who attended the recent London Rubber Show in London, has returned from England, arriving in New York on the "Celtic" on August 15. Mr. L. J. Plumb, chief chemist of this company, at last report was marooned in Berlin.

Mr. Arthur W. Townsend, who was mentioned in the August issue of THE INDIA RUBBER WORLD as having recently started on a tour around the globe, decided, because of the uncertain conditions in the East, to cut his trip short. He is now on his return journey across the Pacific, on the steamship "China," and will arrive at San Francisco September 6.

J. H. Ficken, formerly New York City sales representative of the United States Tire Co., has become associated with the Kelly-Springfield Tire Co.

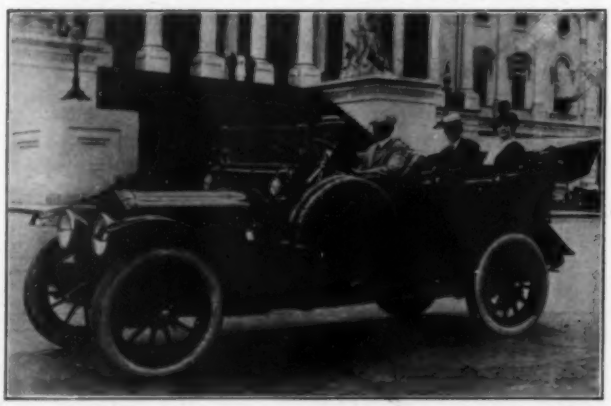
Charles Hieneman, who several months ago was sent to Mexico by the Fisk Rubber Co., has recently returned to Los Angeles after three months' war service as general overseer of the motor car brigade of the Villa forces, with the title of sergeant, having been influenced by the flattering offer of salary—paid regularly in American gold—to undertake this work.

MR. LAIGHTON LEAVES THE APSLEY COMPANY.

Mr. William B. Laighton, who has been associated with the Apsley Rubber Co. for the last fourteen years—during the latter part of that time as treasurer and director—has recently resigned from his connection with that company. Before going with the Apsley company Mr. Laighton was selling agent for the Candee Rubber Co. for a number of years. His experience with these two companies has given him a knowledge of rubber footwear making and selling that very few men possess.

VICE-PRESIDENT MARSHALL IN HIS AUTOMOBILE.

The motor car is becoming more and more a valuable adjunct in the nation's affairs, facilitating the activities of the country's executives while adding to their comfort and convenience. We reproduce herewith a photograph showing Vice-



VICE-PRESIDENT MARSHALL.

President Marshall in his big car, which is one of the familiar sights of the Washington boulevards. This picture was taken by a Firestone tire enthusiast, the car being equipped with tires of that make.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

FRANCIS H. APPLETON, JR.

Few men in the rubber trade have accomplished more in their own chosen line than Francis H. Appleton, Jr., the secretary-treasurer of the well-known rubber reclaiming concern of F. H. Appleton & Son, Inc., of Boston and Franklin, Massachusetts.

Mr. Appleton is the son of Francis H. Appleton and Ida Cook Appleton, the latter a daughter of Martin Cook, of the old firm of W. H. Jackson & Co., manufacturers of grates and fenders, of New York City. Born in 1875 in Union Square, young Appleton was educated at Trinity School, and later took a very thorough technical course under private tutorship.

When his father started reclaiming rubber from scrap in 1898, young Appleton went into the factory. Being naturally an investigator, with a good knowledge of chemistry and mechanics,

FRANCIS H. APPLETON, JR.

he took upon himself the task of improving the output of the works, so that the stock would come out cleaner, and therefore be more marketable. His success was complete, and the material became so superior that the trade quickly absorbed the entire output.

After having succeeded with scrap boots and shoes, Mr. Appleton turned his attention to the reclaiming of mechanical scrap, and the result of a year's investigation and experiment was the working out of a process for reclaiming all kinds of mechanical stuff, and carloads of the waste from different factories were taken, from which was extracted a fine quality of workable rubber. He was the pioneer in this restoration, as he was also, later, in producing a high-grade rubber from worn automobile tires.

Mr. Appleton has proved himself thorough in investigation, apt in invention and most resourceful. He succeeded in giving to the rubber trade a high-grade stock which has always been marketable at a price commensurate with its quality.

Mr. Appleton resides in Franklin, where the factory is situated. He married Miss Carrie Goodwin, and there is one son, Francis H. Appleton, third, a name of which the little fellow is exceedingly proud. Mr. Appleton is a man of many attractive qualities, which have made him a host of friends both in and out of the rubber trade. He has been a member of the Rubber Club of America since 1905. He stands high in masonic circles, being Deputy High Priest in his district. He is also a member of the Ancient and Honorable Artillery, of which his father is an ex-commander. When that company went to London two years ago, and, as guests of the parent company, were received by King George V, three of the company bore the name of Francis H. Appleton, father, son and grandson. The latter, then eight years old, marching with the elders, clad in his Boy Scout suit of khaki, created much favorable comment and newspaper praise for his youthful, soldierlike bearing, an inheritance from his forbears.

AS TO RUBBER CARGOES AFLOAT WHEN THE WAR BROKE OUT.

The secretary of the Rubber Club issued a circular letter on August 8 to the firm members of the club inviting them to cooperate with representative members of other industries in appealing to their respective senators and representatives to take up with the State Department the matter of getting exemption for cargoes of raw material (the members of this club of course being particularly interested in rubber cargoes) that might be afloat in ships that left their ports before the declaration of war.

As the State Department received a vast number of requests for information on the subject of contraband cargoes as affected by the President's declaration of neutrality, the solicitor of the department, Mr. Johnson, prepared a statement for general distribution. This statement shows that contraband articles may be shipped but that they will be shipped at the owner's risk. Mr. Johnson continues:

"Vessels flying the flag of one of the belligerents are subject to seizure and confiscation by the opposing belligerents. Contraband of war on board such vessels is, of course, subject to confiscation, though the property is neutral.

"Goods not contraband, belonging to a neutral aboard a captured vessel, are subject to delay and interruption consequent upon the seizure of the vessel, but not to confiscation, upon manifestation of neutral ownership and the non-contraband character of the goods."

THE ANNOUNCEMENT OF THE RUBBER CLUB.

On August 11 the secretary of the Rubber Club sent out an official announcement from the club to a number of the leading papers of the country as to the condition of the crude rubber market and also of manufactures as affected by the outbreak of hostilities in Europe.

THE FIFTEENTH YEAR BOOK OF THE RUBBER CLUB.

The fifteenth year book of the Rubber Club of America, for the current year, just issued by the secretary, is a much more pretentious book than the club has hitherto prepared for its members. The present issue is a book of 48 pages, size 6 x 9, with 2 photographic inserts. It gives the present officers and directors and members of the standing committees; the proceedings of the last annual meeting, held in Boston in April, and the reports of the president, treasurer and secretary, submitted at that time. A new and interesting feature of the book is a historical sketch of the club and its predecessor, the New England Rubber Club. The year book also contains the articles of association, the charter granted by the State of Massachusetts, the officers of the club since its organization, its constitution and revised by-laws and a list of its members; showing that it has at present 3 honorary, 68 firm, 209 active and 58 associate members—a total membership of 338.

The two inserts consist of reproductions of the photographs of the club group at the annual midsummer outing in July, 1913, and of the annual midwinter dinner held in New York last January.

NEW INCORPORATIONS.

Apsley Rubber Co., July 20, 1914; under the laws of Illinois; authorized capital, $100,000. Incorporators: L. D. Apsley (president), Pleasant street, and Milton T. Bailey (secretary), 55 Cottage street—both of Hudson, Massachusetts. To purchase the necessary materials to manufacture all kinds of goods, fabrics, merchandise—including boots, shoes, sandals, made in part or wholly of rubber—manufacturing, selling and exchanging same.

Atlas Tire & Rubber Co., The, June 26, 1914; under the laws of Ohio; authorized capital, $5,000. Incorporators: J. M. Bernstein, E. E. Gross, E. J. Bokor, F. Allen and J. M. Ulmer. To deal in tires, rubber goods and auto. supplies.

Day Tire Protector Co., July 24, 1914; under the laws of Delaware; authorized capital, $100,000. Incorporators: F. R. Hansell, Philadelphia, Pennsylvania, and Geo. H. B. Martin and E. T. Vennel—both of Camden, New Jersey. To manufacture, buy, sell, trade, deal in and with automobile tires, parts and accessories.

Gordon Rubber Co., August 4, 1914; under the laws of Massachusetts; authorized capital, $10,000. Incorporators: Louis Hahn, president, 121 Chambers street, Boston; Mark Baron, secretary, 7 Poplar street, and William M. Gordon, treasurer, 18 Arlington street—both of Chelsea—all in Massachusetts. To manufacture reclaimed rubber, rubber disc washers and rubber bands. The principal office and factory are located at 31-35 Broadway, Chelsea, Massachusetts.

Gould Commercial Co., July 14, 1914; under the laws of Delaware; authorized capital, $225,000. Incorporators: F. D. Buck, Geo. W. Dillman and M. L. Horty—all of Wilmington, Delaware. To export, import and generally deal in merchandise of every class and description.

Harris-Henderson Tire Co., June 20, 1914; under the laws of Ohio; authorized capital, $5,000. Incorporators: J. A. Harris, F. A. Henderson, John C. Barkley, Raymond L. McVean and John P. Dempsey. Location of principal office, Cleveland, Ohio. To buy and sell tires, etc.

King Tire Protector Co., July 13, 1914; under the laws of Maine; authorized capital, $500,000. Frank L. Farrington, president, Augusta, Maine. To deal in tires, automobiles and all kinds of automobile equipments.

Kingstone Tire & Rubber Co., Inc., July 31, 1914; under the laws of New York; authorized capital, $2,000. Incorporators: Sydney Bernheim, 305 West Seventy-second street, New York, New York; Catherine Weldon, 591 Seventh street, and Harry H. Jacobson, 555 Grand street—both of Brooklyn, New York. Auto tires, etc.

Lee Tire & Rubber Co., of New York, Inc., August 13, 1914; under the laws of New York; authorized capital, $20,000. Incorporators: Harry E. Field, 440 Riverside Drive, New York, New York; Albert A. Garthwaite, Conshohocken, Pennsylvania, and John J. Watson, Jr., Brookville, Long Island, New York.

Lighthouse Tire Co., Inc., July 23, 1914; under the laws of New York; authorized capital, $5,000. Incorporators: John McLaren, F. B. Knowlton and S. V. Dowling—all of 154 Nassau street, New York, New York. To manufacture and deal in rubber tires for automobiles, etc.

Lighthouse Tire Co., July 25, 1914; under the laws of Delaware; authorized capital, $1,000,000. Incorporators: John McLaren, F. B. Knowlton and S. V. Dowling—all of 154 Nassau street, New York, New York. To manufacture, buy, sell and deal in automobile tires and motor tires and wheels and accessories of every class and description.

Merrill Shoe Co., Inc., June 22, 1914; under the laws of New York; authorized capital, $25,000. Incorporators: Joseph B. Cousins, John L. Hodgson and Ernest C. Wheeler—all of 369 DeKalb avenue, Brooklyn, New York. To deal in skins, hides, rubber, etc.

Montauk Rubber Co., Inc., July 23, 1914; under the laws of New York; authorized capital, $5,000. Incorporators: Hymann Friedland, 331 Thirteenth street; Wm. G. Turner, 1484 East Fourteenth street—both in Brooklyn, New York—and Leo Londoner, 751 East One Hundred and Sixty-eighth street, New York, New York. To manufacture and deal in rubber goods, etc.

Perfection Rubber Co., July 8, 1914; under the laws of Rhode Island; authorized capital, $100,000. Incorporators: John B. Des Rosiers, 567 Westminster street; John T. Bannan, 313 Prairie avenue—both of Providence—and Ildege Des Rosiers, 6 Mason street, Pawtucket—all in Rhode Island. To manufacture, sell, market and otherwise dispose of a certain patented article known as "The Perfection Sanitary Belt."

Robinson-Seitz Tire Co., July 31, 1914; under the laws of New Jersey; authorized capital, $5,000. Incorporators: George W. Robinson and Frank Robinson—both of 19 Vose avenue—and Arthur M. Seitz, 66 Comstock place—all of South Orange, New Jersey. To manufacture, sell, and generally deal in tires for automobiles, etc.

Steel Pneumatic Tube & Tire Co., Inc., August 10, 1914; under the laws of New York; authorized capital, $200,000. Incorporators: John S. Heep, Frederick Fuller and Chas. O. Roth—all of 40 Wall street, New York, New York. To deal in tires of every kind, and other auto accessories.

Uneeda Tire Filler Co., of New York, Inc., August 1, 1914; under the laws of New York; authorized capital, $100,000. Incorporators: Max E. Rosenthal, 973 Tiffany street; Thomas Bligh, 2306 Seventh avenue—both in New York, New York—and Jos. Golden, 9 St. Marks avenue, Brooklyn, New York. To manufacture tire filler for automobile tires, etc.

RUBBER CLOTH IN GREAT DEMAND.

The Fairfield Rubber Co., of Fairfield, Connecticut, which includes in its product a large output of rubber cloth for use in the manufacture of automobile tops and seat covers, has recently received an order from the Ford company for all the rubber cloth that can be produced. The execution of this order necessitates the operation of the plant night and day and will probably call for an additional force of operatives.

A NEW FACTORY FOR THE SUSSEX RUBBER CO.

The Sussex Rubber Co., which was incorporated June 1, with a capital stock of $50,000, is erecting a factory at East Rutherford, New Jersey, for the manufacture of tire sundries, tubes, molded goods, packings, etc. This building, which is of brick, of heavy mill construction, has a floor area of 60 x 110 feet, and will probably be completed early in October. The officers of the new company are: C. F. Teigeler, president; W. M. Sharpe, vice-president and manager, and A. E. Teigeler, secretary and treasurer.

WILSON TIRE & RUBBER CO. BUILDING AT SPRINGFIELD.

The Wilson Tire & Rubber Co., incorporated under the laws of Michigan, with a capital stock of $1,000,000, is erecting a factory at Harvard Park, Springfield, Illinois. This factory, which is now nearing completion and will have at the start a capacity of 500 tires and 500 rims per day, will cost about $150,000. It is situated just outside the city limits, on a ten-acre plot presented to the company by the Springfield Commercial Association. Forty per cent. of the stock issue of the company has been awarded for patent rights in the Wilson Pneumatic Tire, brought out about four years ago, and the Wilson Demountable Rim, which will constitute the product of the plant. The officers of the company are: E. W. Wilson, president; P. J. Jeup, vice-president; W. W. Gardner, treasurer, and A. P. Hicks, secretary. And these officers, with T. Reuther, R. N. Baker and Frank H. Watson, compose the board of directors.

CONTINENTAL RUBBER WORKS.

At the annual meeting of the Continental Rubber Works, held August 3 at the company's offices at Erie, Pennsylvania, the officers and directors of 1913 were re-elected for the ensuing year. These officers are: T. R. Palmer, president and general manager; A. Jarecki, vice-president; Charles Jarecki, secretary, and C. S. Coleman, treasurer. The first three officers are also on the board of directors, which likewise includes Fred. C., Robert and R. K. Jarecki, O. E. Becker, Jacob Roth and J. M. Thayer.

The Continental company has recently added to its line of production the Vitalic Clincher Casing (cut of which is here shown) for motorcycles, made along the same lines as the well known Vitalic Single Tube Tire. The factory is also turing out tread bands for worn out bicycle tires, as well as a number of novelties, one of which, the Continental-Erie Repair Band, is also illustrated herewith. This repair band, made of high grade rubber, can also be used as a luggage carrier. Another novelty is a Mud Guard Splasher, something that will surely appeal to every bicycle rider, for whose use it is specially intended.

THE TRAFFIC DEPARTMENT OF THE MOTOR AND ACCESSORY MANUFACTURERS' ASSOCIATION.

A few years ago a traffic service was inaugurated by the Motor and Accessory Manufacturers, an organization of the leading American makers of automobile parts and accessories. Since that time this department has developed such efficiency that thousands of dollars have been saved for members of the association who have made use of it. Any member may send all of his freight bills to the department, and each separate shipment will be carefully checked by experienced men to ascertain if the railroad or steamboat line has made an overcharge.

Some idea of the scope of the work, and how it is appreciated by members, is made evident by a few comparative statistics. The first year it was in operation (1911-1912) 43 members made use of it. During the fiscal year, July 1, 1913, to June 30, 1914, the department was used by 136 members, a total of 803 times. During that period 51,690 freight bills were audited, and out of the number a very material percentage were found in error, warranting traffic claims being entered.

Aside from auditing freight bills an important feature is the matter of consultation on shipper's rights on traffic matter of any character. If a member wishes to be advised how his particular article or commodity should be packed, described or billed, to secure the lowest transportation charge, he can secure this information from the department.

Mr. J. S. Marvin, general traffic manager of the National Automobile Chamber of Commerce, has direct supervision of this work, that has resulted in great benefit to the members who have taken advantage of this service.

A NEW PARTNERSHIP.

On the 10th of August, Wallace L. Gough and Clement B. McKay entered into a partnership agreement under the name of Wallace L. Gough & Co. and will be engaged—as Mr. Gough has been hitherto—in the importation of india rubber, gutta percha, balata and allied products.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

TRADE NEWS NOTES.

A certificate of incorporation has been filed with the Secretary of State by the Lee Tire & Rubber Co., of Manhattan. The incorporators of the company, which is capitalized at $20,000, are: A. A. Garthwaite, of Conshohocken, Pennsylvania; H. E. Field, of New York City, and J. J. Watson, of Brookville, New York.

The Panther Rubber Manufacturing Co. is erecting a two-story addition to its plant at Monk and Washington streets, Stoughton, Massachusetts.

The sale of the Walpole Tire & Rubber Co. was not held on August 12, as arranged, being postponed owing to existing financial conditions created by the war in Europe. Notice to this effect was mailed by the receivers on August 10 and of a hearing to be held on August 31 on the question of fixing a new date of sale. A further dividend of 4 per cent. has recently been authorized, making 12 per cent. thus far distributed to the creditors.

The plant of the Star Rubber Co., of Akron, which several weeks ago went into the hands of a receiver, has been ordered sold at public auction. Sale will not be made, however, at less than two-thirds of the appraised value of the plant. This action is said to have been taken at the instance of the administrator of the estate of the late Homer Hine, former treasurer of the company.

The Norwalk Tire & Rubber Co., incorporated March 23 last, is soon to begin the manufacture of automobile tire casings. Thus far the product of the company's plant, located at Belden avenue, Norwalk, Connecticut, has been confined to inner tubes, but arrangements are under way for adding to the force and equipment and extending the line of production.

The building formerly occupied by the Leicester Rubber Co., at Catasauqua, Pennsylvania, and which was destroyed by fire on July 19, is to be replaced at once by a larger structure to occupy the site of the old plant.

Fifty employes of the Michelin Tire Co., of Milltown, New Jersey, including heads of departments as well as workmen—all natives of France—called upon by their home Government to report for war duty, have been granted indefinite leave of absence and their places have been temporarily filled.

During the past month the Hodgman Rubber Co. transferred the location of its mackintosh and rain coat department from Mt. Vernon, New York, to the main factory at Tuckahoe, in the same state, this department occupying a building especially erected for the purpose, and thus consolidating all the manufacturing operations of this company in one plant.

The makers of Diamond tires have been awarded a contract for supplying the tires required by the parcel post department to equip its automobiles in use all over the country.

Francis R. Peabody, vice president of the Acushnet Process Co., of New Bedford, Massachusetts, has removed to Akron, Ohio, where a branch has been established in order better to look after the interests of the company in that district.

FISK RUBBER CO. PLANS FURTHER EXTENSION.

The Fisk Rubber Co., of Chicopee Falls, Massachusetts, which is now erecting a three-story addition to its warehouse, also has plans under way for a duplication of its entire plant next year should present gains be maintained and thus warrant it.

This company has recently closed a lease for a new building to be erected at 2206 Locust street, St. Louis, Missouri, to be occupied by its branch in that city. This building will be two stories and basement and will be ready for occupancy by January 1 next.

Arrangements have also been made for the lease of a building to be erected at Tenth, Oak and Burnside streets, Portland, Oregon, to be occupied by the Fisk company.

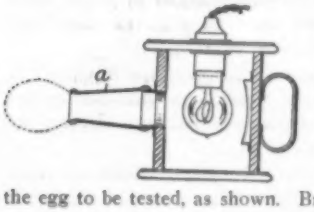
New Rubber Goods in the Market.

A PNEUMATIC PEN FOR PLASTICS.

AN instrument has been recently invented for writing, marking or decorating with plastic materials. The pen barrel is hollow, and connected to the rubber bulb in which the liquid plastic is placed. In operating the device the writer takes the pen in one hand and presses the air bulb with the other.

This forces the air through the rubber tube, compressing the plastic material which flows out at the pen point. A fine or coarse line can be drawn by varying the speed movement of the pen or by pressure on the air bulb. The latter is provided with a check valve. This device can also be used for applying the fancy decorations on wedding or birthday cakes. Patent No. 1,099,344.

RUBBER IN EGG TESTING.



The egg testing device illustrated herewith comprises a tube of rubber, tapered at one end and with beaded edges. The larger end of the tube is placed over the lens of a portable electric lamp, and the other is applied to the egg to be tested, as shown. British Patent No. 6,183 (1913).

THE CASTLE DANCING PUMP.

This new dancing shoe has been designed to meet the requirements of lady tango enthusiasts. A band of elastic fabric extends over the instep, holding the shoe in place. A leather strap and buckle conceal the elastic fabric. This strap is provided with a fastening device at one end which can be unclasped when it is desired to remove the shoe.

THE "SANITOR."

One of the latest sanitary inventions and aids to health is the "Sanitor," a device for cleansing the mouth by vacuum drainage and for massaging the gums, thereby stimulating a full flow of blood to the tissues—effects considered exceedingly beneficial in Pyorrhea. The invention consists of a rubber mouth cup which fits over the teeth and gums of either jaw, connected by means of a rubber tube with a motor operated pump. In the dental office this device is used also for draining Aviolar abscesses. [The Sanitor Co., Chicago.]

THE PHO-NO-GERM.

The part that rubber plays in the "Pho-No-Germ," or telephone disinfector, will be seen by reference to the accompanying cut, which shows the disinfector attached to the telephone transmitter. The container is filled two-thirds full with an antiseptic solution, which under laboratory tests has been found to kill such deadly germs as staphylococci, streptococci, diphtheria and typhoid, any or all of which might be distributed by the medium of the telephone. A few pressures of the rubber vacuum-bulb of this antiseptic liquid-containing disinfector, however, is sufficient to clear the line. [The Only Telephone Disinfector Co., Westerville, Ohio.]

RUBBER PLUMMETS FOR JUMP STANDS.

The cords on the jump stands which form a part of field sports apparatus are now provided at their ends with rubber plummets, so that should a contestant fail in his attempt to clear the cord and instead become entangled in it, he may sustain no serious injury through contact with the weights used to hold the cord in place.

A PIECE OF RUBBER ERASER FOR A REEL-SEAT.

A fisherman with an ingenious turn of mind has discovered that the use of a small piece of rubber keeps the reel-seat of his rod taut and firm and makes a highly satisfactory arrangement. He bought an ordinary eraser, cut off a section about half an

inch long, cut out a little of the rod in the center of the reel-seat and inserted the piece of rubber. When the reel is pressed down in place on this piece of eraser and fastened in the usual way it cannot come loose. This is not, perhaps, an important new use of rubber, but one that will be interesting to fishermen.

THE DIME SCREEN DOOR CHECK.

A bumper has been devised to prevent the annoyance of slamming screen doors. It is made of molded rubber, tapered to give the greatest amount of spring, and is attached to the door frame. It is operated in connection with a plunger on the door and is said to be most effective, giving equal satisfaction whether the door is opened wide or only partly opened, as it does not depend upon the momentum of the door to make it work. As its name suggests, the price of this check is only ten cents. [The Caldwell Manufacturing Co., Rochester, New York.]

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

IMPROVEMENTS IN RUBBER PAILS.

THE rubber bucket has been on the market for some time THE INDIA RUBBER WORLD of September, 1901, contained an illustrated description of the Goodrich collapsible bucket, and the issue of October, 1912, showed that company's improved pail with strainer spout, while various other rubber pails have been noted as they made their appearance. But improvements which render it of greater practical value have been made from time to time, and the cuts herewith illustrate two of the latest developments in the manufacture of this useful accessory.

The first cut shows a cloth-lined rubber bucket with reinforced center, double bottom and corners—to prevent leaks—and strong handles that will not pull out. It is collapsible and has a capacity of a gallon and a half. It is known as the W. T. Co. rubber pail. [Whitall Tatum Co., New York.]

The second cut illustrates a folding water pail with legs and handles. This is made of waterproof canvas, rubber coated, and is supplied with four pieces of hard wood, which are pushed into spaces provided on the sides, thus keeping the bucket rigid and forming substantial legs for its support. When not in use, these wooden legs may be slipped into a loop on the bottom of the bucket, which can be folded into a very small space. The third illustration shows a basin made on the same lines as the bucket. [Abercrombie & Fitch Co., New York.]

ALGOT LANGE BACK IN THE UNITED STATES.

Several thousand people in the United States are familiar with the explorations of Algot Lange, a traveler and writer of Danish origin but for several years past a resident of the United States. His book, "In the Amazon Jungle," issued about two years ago, was one of the most interesting narrations of tropical exploration yet put into type. He also acted as lecturer at the rubber show held in New York in the fall of 1912, describing the Amazon country with stereopticon views made from photographs taken by himself. His lectures were largely attended. Mr. Lange recently returned to New York after an absence of a year and a half spent in further exploration along the Amazon. He devoted most of his attention during this time to the Lower Amazon, where he undertook a number of exploring expeditions in behalf of the Brazilian Government. He has brought back with him an interesting collection of idols, ceramics and funeral urns taken from a sacred mound in the Sinking Island, about 200 miles north of Pará. These relics Mr. Lange thinks were left in this mound many centuries ago by a nomadic tribe from Asia, the tracery and other markings on the urns appearing to indicate an Asiatic origin. Incidentally, Mr. Lange vouches for Roosevelt's discovery of a river a thousand miles long. He, moreover, states that there are still other rivers just as large in the heart of Brazil awaiting discovery.

THE RUBBER TIRE.

EMERSON says "The first man who made a pair of shoes carpeted the earth with leather."

The invention of the rubber tire made the automobile possible.

And if rubber tires had been invented before iron wheels were utilized, the railroads would never have existed.

When Stephenson discovered that it was impossible to make speed on a roadway with an iron-wheeled vehicle, he laid wooden rails and covered them with strips of iron, thus getting a comparatively smooth surface.

When I used to jog horses with my neighbor Ed Geers, the "Silent Man," I realized, in driving a single block over a macadam pavement from the barn to the track, how impossible speed was on any road except one specially prepared.

The race track was made of loam and tanbark.

Here was a soft footing for the iron-shod feet of the horses, and a yielding pavement for the iron tires of our sulkies.

One fine day some one sent to Ed Geers a present of a little low-wheeled sulky. The wheels were evidently those taken from a bicycle. At that time I had never heard of ball bearings. But I soon understood that the ball-bearings shift the friction from one place to a great many.

The little low-wheeled sulky was laughed at, then admired. Finally Ed Geers hitched a horse to it. Two turns around the half-mile track and his horse was used to the contrivance.

It ran as silently as Ed Geers himself, and with so little friction that it seemed to be chasing the horse and pushing him along.

And I saw that the horse was drawing the sulky by the reins, and not by the traces.

And so we came down the homestretch, neck and neck. And then Ed Geers drew out in front of me very easily and went under the wire three lengths ahead. We tried it again, and the "Silent Man" delivered himself thus: "It means about ten seconds on the mile." Then he dived into silence and pulled the silence in after him.

A few days later Ed Geers drove a race with this little low-wheeled, ball-bearing sulky at Buffalo. When he drove out to warm up he got the laugh from the grandstand. But he walked away with the race just the same. He had just ten seconds leeway over the bunch.

The next year on the Grand Circuit not a single high-wheeled sulky was seen. The bicycle tire and the ball-bearing axles had come to stay.

As Emerson's shoemaker carpeted the earth with leather, so has the pneumatic tire paved the roadway with rubber.

Fifteen years ago the principal use for rubber was in making gum shoes for politicians.

The gum shoe is not now so much in demand as it was then.

Doctor B. F. Goodrich was a practising physician at Tarrytown, New York, when the high bicycle came in. It had a solid rubber tire. One day Doctor Goodrich just took a piece of garden hose and fastened it on his high wheel with the aid of wires.

He found that this lessened the bumps, but the hose soon flattened. Then he put a smaller hose inside of the garden hose. And the third move was to blow the little hose that was inside of the big one up with air. Then the pneumatic tire was born.

Curiously enough, a man by the name of Dunlop, in England, did the same thing at about the same time.

It was very much like the invention of the telephone. Gray, of Oberlin; Dolbear, of Tufts; Alexander Graham Bell, of Boston, and Thomas Alva Edison, of the round world, turned the trick at the same time.

Everybody now agrees that it is the rubber tire and the pneumatic inner tube that make the automobile possible. With the iron tire we would still be hitting the pavement at five miles an hour and no more.—*Elbert Hubbard, in the New York American.*

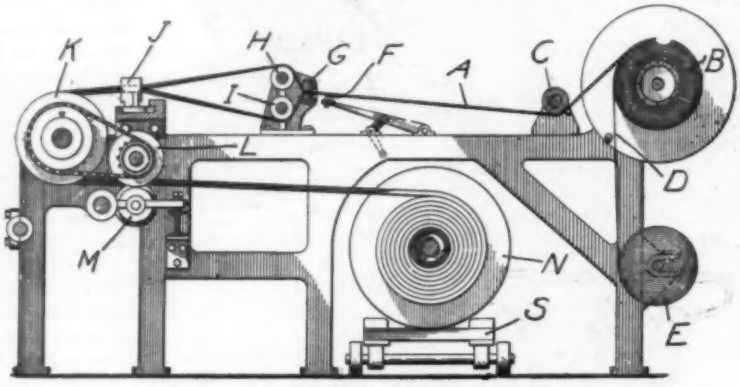
New Machines and Appliances.

STEVENS' BEAD FORMING MACHINE.

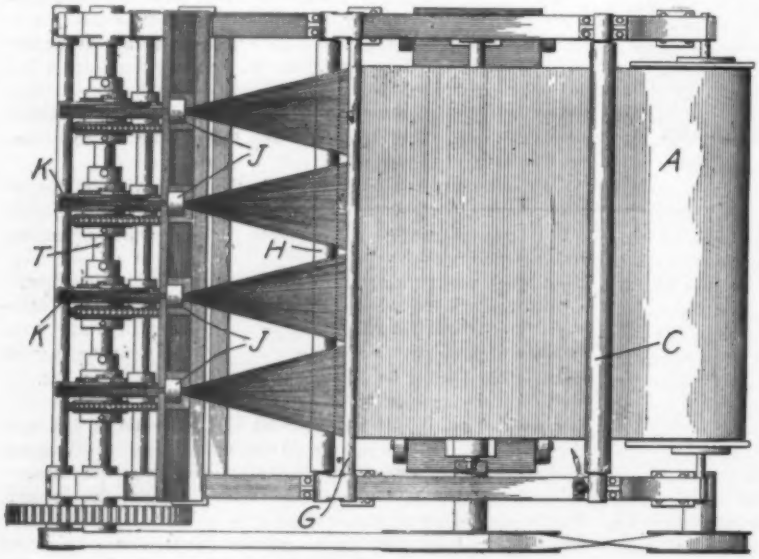
THE drawings herewith show a side view, partly in section, and a top view of a new bead forming machine, designed by William C. Stevens, of the Firestone Tire & Rubber Co., of Akron, Ohio. The machine forms four beads simultaneously from narrow strips of impregnated fabric.

The fabric used in this process is made in a sheet 44 inches wide, being composed mostly of strong, longitudinal threads and comparatively few weft threads, of less strength, so that the fabric may be easily slit into strips. The fabric *A* is unwound from a supply roll *B*, and is passed under a guide roller *C*. The liner sheet *D* is wound up on a reel *E*. The fabric passes over a series of knives *F*, 175 in number, and is slit back for a distance of about 2 feet, into strips ¼ of an inch in width. The ends of these strips are passed between presser rolls *G* and then, alternately, one above the roller *H*, and the other below the roller *I*. After being thus separated the strips are led into bunching dies *J*, four in number, where they are gathered into four groups and passed into V-shaped grooves in the fillet-forming wheels *K*. The rubber with which the fabric is impregnated is unvulcanized and still tacky and helps hold the beads in shape after leaving the grooved wheels *K*. The four beads then pass between grooved rollers *L* and presser rollers *M*, which give them their final shape. The speed of this last set of rollers is greater than that of the wheels *K*, so that in addition to being compressed, the beads are subjected to a tension to remove the slack from the warp threads. The completed beads are wound up on reels *N*, mounted on a car *S*. When the reels are full the shaft is disengaged from the driving mechanism, and the car is run from under the machine frame.

When the fabric is first led from the supply roll and slit by means of the knives *F*, these knives are lowered out of contact with the fabric, which is then slit by the rollers *H* and *I*. The forming rollers and bunching dies are mounted on splined shafts, so that they may be adjusted longitudinally in case more or less than 44 strips are to be used in forming the beads. Between each of the grooved wheels *K* and their common shaft *T*, is a ratchet connection, by means of which the operator may turn any of the wheels independent of the others, in order to maintain a uniform tension in all of the four groups of strips.



SIDE VIEW OF STEVENS' BEAD FORMING MACHINE.



PLAN VIEW OF STEVENS' BEAD FORMING MACHINE.

ANOTHER SAFETY APPLIANCE FOR THE RUBBER MILL.

THE present campaign for "safety first" being waged by public service corporation and manufacturers generally has led to the introduction of many devices intended to aid the operator in the prevention of accidents. The wide-awake executives of rubber goods factories have not been slow to appreciate the advantages of such devices as applied to their special needs. These columns have, from time to time, set forth the advantages of the different types of safety devices applicable to the rubber mill.

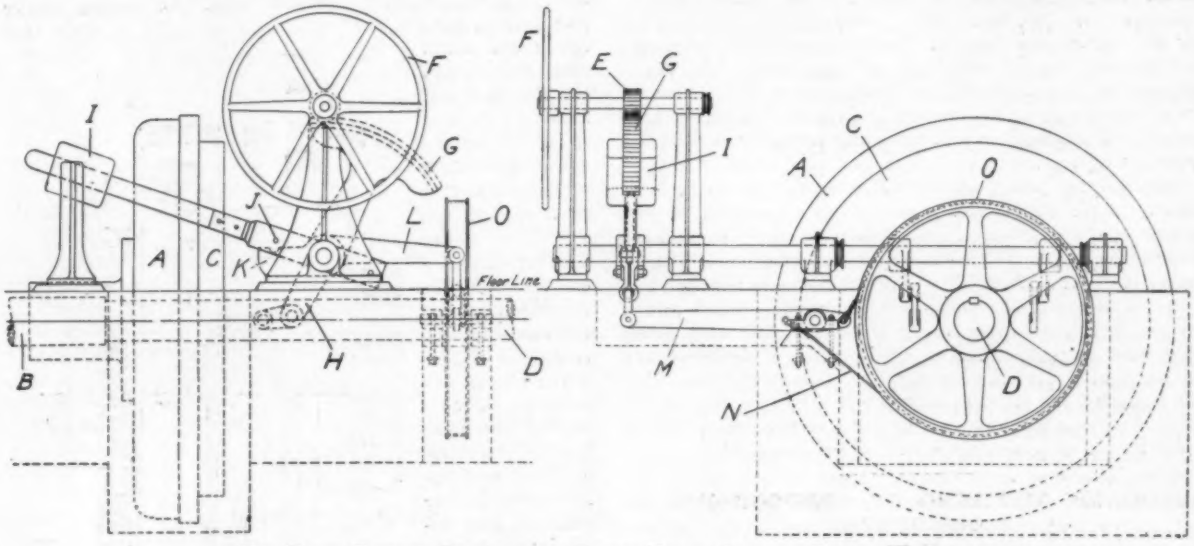
As another example of a quick operating, safety throw-out device which has been developed for this work, we illustrate herewith the Dodge split friction clutch and gravity brake. In this device the clutch is located on the line shaft supplying power to the machines, and is placed under the control of the operator by means of a bar or cord suspended over each machine. A slight pull on this bar or cord automatically releases the clutch and cuts off the power.

Because of the kinetic energy possessed by the rotating parts of the mills and shafting, the machines do not come instantly to rest and the danger to the operator, though greatly reduced, is not entirely eliminated. To secure a complete stoppage of the machines in a short time, a simple type of band brake, automatically released and applied by the force of gravity, is placed on the driven line.

Reference to the accompanying drawings, which show a side elevation and an end view of the clutch and brake, will give a good idea of its construction and operation. One part *A* of the clutch is keyed to the power shaft *B*, while the other part *C* of

the clutch is keyed to the mill shaft *D*. To engage the clutch, a pinion *E* operated by a hand wheel *F* is engaged with a segment *G*, so that when the wheel is turned the lever *H* is thrown to the left to force the clutch together.

In case of emergency, the cord or bar suspended over any one of the machines is pulled, releasing the weight *I*. As this weight falls the pins *J* engage the lugs *K*, raising the lever *L*. This action also raises the lever *M* and applies the brake band *N* to the brake drum *O*. Any effective force desired may be secured at the brake band by varying the distance of the weight *I* from its center of rotation. The clutch may be built in any size up to 1,000 horsepower at 100 r. p. m.



THE DODGE FRICTION CLUTCH WITH SAFETY THROW-OUT AND EMERGENCY BRAKE.

RECENT MACHINERY PATENTS.

ASIDE from the machines described above, there are a number of other interesting devices recently patented in this country and abroad, but which lack of space prohibits illustrating. These are briefly described below.

U. S. Patent No. 1,099,535, June 9, 1914. Granted to A. C. Bolton, and assigned to the Gutta Percha & Rubber Manufacturing Co., of New York. This is a machine for wrapping hose with fabric preparatory for vulcanizing. Instead of applying the fabric in a spiral winding, it first wraps a strip of fabric longitudinally around the hose and then applies a spiral winding outside of this. This eliminates the spiral marks left by the edges of the fabric. The hose mandrel is omitted and the hose inflated with air while being wrapped. The machine may also be used for unwrapping the fabric after vulcanizing.

U. S. Patent No. 1,099,763, June 9, 1914. Granted to Russell Parker of Parker, Stearns & Co., Brooklyn, New York. In the specifications of this patent are described an apparatus and a process for making rubber covered belts, such as are worn by women for holding down the shirtwaist and supporting the skirt. The process may also be used for making men's belts or garters, and for driving belts.

U. S. Patent No. 1,100,002, June 16, 1914. Granted to C. L. Van Ness, of Akron, Ohio. Mr. Van Ness has invented a multiple insulating head for application to forcing machines, by means of which several wires may be covered with rubber simultaneously. The head has six dies, each of which is adjustable independently of the others. It is provided with cooling chambers and may be adjusted so that the dies lie at any angle from horizontal to vertical. In order to prevent overloading the head and to insure a uniform coating of the wires, a relief valve is provided to maintain a uniform pressure of the insulating compound.

U. S. Patent No. 1,100,934, June 23, 1914. Granted to J. K. Williams, of Akron, Ohio. This invention is a vulcanizing press for curing tires, in which the bearing members for the hydraulic ram are accessible from the outside, eliminating the necessity for taking down the press or going into the vulcanizing chamber.

U. S. Patent No. 1,101,053, June 23, 1914. Granted to W. L. and O. Bland, of Chicago, Illinois. This is a molding machine adapted to mold rubber articles without flashing the material from the dies and forming ribs or fins on the finished product. The drawings of this device illustrate the machine with dies for molding telephone receivers. The material is fed into a hopper and forced by a conveying screw, like a tubing machine, into feeding channels, and from there into the dies. The parts of the mold are forced together by four hydraulic presses, one on each side, one at the top and one at the bottom of the machine.

U. S. Patent No. 1,101,555, June 30, 1914. Granted to C. Kuentzel and assigned to the Goodyear Tire & Rubber Co., of Akron, Ohio. This is a machine for wrapping and unwrapping tires before and after vulcanizing. It may also be used for wrapping tires with paper for shipment, and also for covering rolls of wire and cable. The machine is similar to Kuentzel Patent No. 1,079,601, which was described in the February issue of THE INDIA RUBBER WORLD. The present machine differs from the former principally in minor details of construction, such as the holding device for the tires and the method of drive.

U. S. Patent No. 1,101,732, June 30, 1914. Granted to Henry J. Doughty and assigned to the Doughty Tire Co., of Portland, Maine. This invention is a combination tire mold and vulcanizing press. The mold is made in three parts and the core in eight segments. The tire is first roughly built up into the desired form and placed in the center mold section, which covers the tread portion. The press operates by hydraulic power, and when pressure is admitted four of the core segments are first expanded into the tire and the remaining four segments are then forced between these to expand the tire against the tread mold. The press is then operated to force the upper and lower mold sections together, completely enclosing the tire, after which steam is turned into heating chambers surrounding the mold.

U. S. Patent No. 1,102,178, June 30, 1914. Granted to W. B.

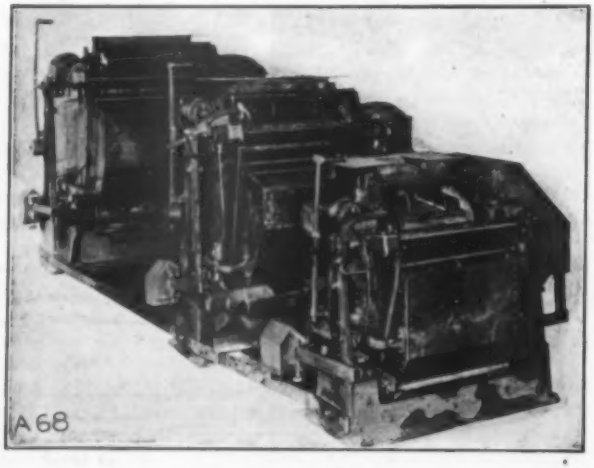
and E. W. Wescott and assigned to the Walpole Shoe Supply Co., of Boston, Massachusetts. This invention relates to an apparatus for heating strips of cement-coated fabrics used in the manufacture of "Gem" insoles. The machine eliminates overheating of the coated fabric and makes it easier for the operator to move the strip out of contact with the heating plate than to leave it on the plate too long and then dispose of the spoiled length.

British Patent No. 6,810 (1913). Granted to the Dunlop Rubber Co. Birmingham, England. This is a machine for automatically applying the anti-skid studs to tire treads. The tire is mounted on an annular mandrel having holes in the position for the rivets. The mandrel is rotated by a ratchet to bring the holes successively into register with a riveting device for applying the studs and washers.

French Patent No. 454,444 (1913). Granted to M. R. P. C. Buzat. In the specifications of this patent a spreading machine is described by which unvulcanized sheets for use in surgical and other rubber goods are treated in such a manner as to preserve the nerve of the rubber. The solution is spread in thin layers on a smooth endless band running over two drums. At each turn of the band it receives a thin coating of rubber, which dries during its passage over a heated table. The operation is continued until the layers of rubber are built up to the required thickness, when talc is applied and the sheet is detached. The spreading table is covered with a sheet-iron hood having a suction outlet, through which the solvent vapors are drawn off and recovered.

AUTOMATIC WEIGHING OF COMPOUNDING INGREDIENTS.

THE possible use of the machine shown in the illustration is the reason for its appearance here. In a word, it is a swift, accurate and secretive weighing mechanism which works faster



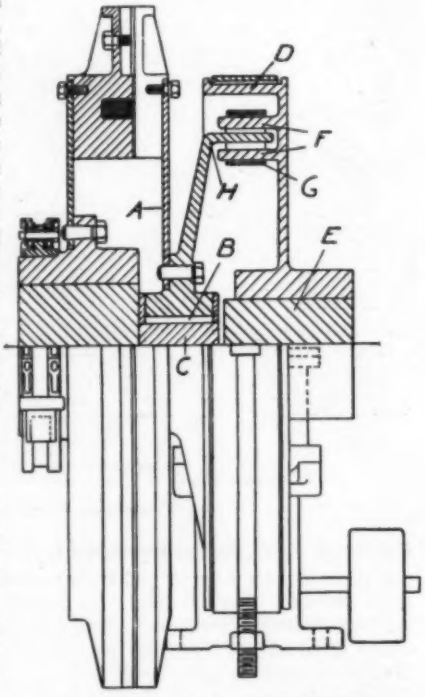
TRIPLE GANG MACHINE.

than any expert human weigher. It is used in a variety of industries where dry ingredients are weighed and assembled. The suggestion is that a gang of these machines could handle the ingredients that go to make up a compound, one for whiting, another for litharge, still another for sulphur and so on. The machine takes the material from a bin, weighs it and dumps it in a pan. The pans would pass in front of the machines and receive the various ingredients in rotation. Of course it would only be practical where single products like tires or shoes are made on a large scale.

Contracts have been let for the erection at Toronto, Ontario, of a chewing gum factory for the William Wrigley, Jr., Co., Ltd.—the largest factory of its kind in the British Empire.

MAGNETIC CLUTCH AND BRAKE WITH FLEXIBLE COUPLING.

THE Cutler-Hammer Clutch Co. has in course of construction a combination magnetic clutch, brake and flexible coupling which, when finished, is to be installed in the plant of the Midgeley Tire & Rubber Co., of Lancaster, Ohio. The coupling is to be placed between the line shaft, which operates the plant, and the main mill shaft, to provide a means for shutting down the entire equipment in case of emergency. The accompanying drawing shows a cross section of the device, through the center of the clutch and brake.



CUTLER-HAMMER MAGNETIC CLUTCH WITH FLEXIBLE COUPLING.

The clutch and brake to be used are of the same type as that illustrated and described in the June issue of THE INDIA RUBBER WORLD. The equipment differs, however, from anything previously supplied to rubber mills, in that the armature member, *A*, of the clutch is carried by a roller bearing, *B*, on an extension, *C*, of the power shaft, and connection is made between the armature and the brake wheel, *D*, which is carried by the mill line shaft, *E*, through a flexible coupling made integral with the brake wheel. This flexible coupling, which forms the feature of the equipment, consists of cylindrical extension, *F*, on the flange carrying the brake wheel. These extensions are slotted and encircled by a rawhide band, *G*. A flange, *H*, carried by the armature member of the clutch, projects into the annular slots encircled by rawhide bands and serves to transmit the torque. This coupling is sufficiently flexible to permit the driving and driven shafts to be out of level as well as out of alignment. The clutch is to have a normal rating of 450 horsepower at a speed of 90 revolutions per minute.

An order for 2,000,000 bales of cotton has been received from Japan by southern planters, to take care of the Chinese demand for finished cotton goods heretofore largely supplied by Germany.

The Russian Government, according to the press of that country, proposes to order 336 aeroplanes for the use of the War Department, all of which are to be completed by the autumn of the present year. Orders have already been placed for three large dirigibles, two of which are to be constructed in France and one in Russia.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

THE TRADE AND THE WAR.

THE abnormal and unprecedented conditions now prevailing impose a certain degree of reticence upon trade journalists. It is permissible, however, to touch upon certain matters in a general way, especially as publication takes place in a friendly state. Ordinary trade is, of course, much disorganized by the trend of events, while, as far as the rubber manufacturers are concerned, it goes without saying that those departments of the works which turn out naval and military requirements are working at high pressure to deliver goods on contract, but which in the ordinary course would not have been wanted for some time. This applies not only to direct government deliveries, but also to the business done with the naval construction yards, etc. Owing to the prolonged closing of the stock exchanges in London and the provinces, business in rubber plantation shares has practically ceased and such quotations as are obtainable are merely nominal.

Among the manufactured goods which it is forbidden to export at the present time are rubber bandages and other hospital requisites. No doubt the same order has been issued with regard to the continental belligerent countries, and possibly the resources of American manufacturers may be requisitioned in Europe to a much greater extent than has previously been the case. The high price of petroleum and the general desire to avoid expenditure on luxuries is causing a large reduction in motoring, though the taking over by the war office of numbers of motor vehicles, more especially of the transport type, should keep up the demand for tires to the exclusion of certain well known makes which need not be particularized. Few rubber goods have their country of origin so clearly marked as have motor tires, a fact which has led to trouble for travelers on the continent.

CONVEYOR BELTS.

With respect to the mechanical rubber trade, the greatest increase as regards individual products in the near future will, I imagine, be in conveyor belts. Although long used in America in connection with the loading and unloading of bulk cargoes, such as coal and iron ores, they are of quite recent introduction to British ports for this purpose. In the loading of vessels with coal in the north of England it has been customary to tip each wagon of a team load into the vessel; now, however, the plan is being adopted of discharging the train loads into large storage bins, from whence the coal is shipped as required by continuously moving conveyor belts. In this way economies are effected of considerable importance to shipping and railway interests. Large belts have been installed recently by some of the railway companies, and it is expected that many important orders will shortly be placed. Ordinary widths of rubber conveyor belting are 36 inches, 42 inches and 48 inches.

THE LIMPLEY STAKE WORKS.

The interesting history of this small works as a nursery for rubber trade developments has entered upon another chapter, as one of the latest rubber tires is now being made there, about which I hope to say more on a future occasion. Originally a saw mill, the premises, which are situated near Bath, in the west of England, were the first home of the Avon Rubber Co., now located in much more commodious buildings at Melksham, a few miles away. Later on Messrs. Wallington and Weston developed their tire business there, before moving into larger premises near Trowbridge. Subsequently Mr. MacLulich took the premises to work the Sirdar tire patent, moving after a year or two to an old woollen mill at Bradford-on-Avon, opposite to which, on the other side of the river, are the works of Spencer, Moulton & Co., so long known in the railway buffer trade and now for their solid tires.

This western district in which the rubber trade is now well established was formerly noted for woollen manufacture, its decay dating from the introduction of this industry into the large Yorkshire towns. Contiguity to the port of Bristol and cheap labor are favorable conditions, the cottages occupied by the workmen being naturally in more salubrious surroundings than are prevalent in the large manufacturing towns.

RUBBER MACHINISTS.

It is a noteworthy fact that, while the number of rubber manufacturers in Great Britain of any real importance has remained stationary, a considerable increase has taken place in the ranks of rubber machinery manufacturers. To some extent the large increase in the use of rubber by firms making a specialty of tire production may be an explanation, but the main reason may be attributed to the plantation industry. The demand for British made washing rolls from the Far East has been large, orders coming not for one or two but for twenty at a time. It may be said that the requirements of the plantations having been satisfied orders from this source will cease. Quite an optimistic opinion prevails, however, among the machinists on this point, as they say the next move will be to replace the small rolls now in use by others of larger size.

PAVEA SYNTHETIC RUBBER.

The latest about this is that work has been stopped at the Handforth plant, although a good deal of machinery has been installed. It is said that some difficulty has arisen in carrying out the process and that at the moment rubber equal to the samples sent out to the trade cannot be made. I give this statement for what it is worth. At any rate, the manufacturers are still waiting for their bulk samples, which are overdue. The works have been taken on a five-year lease at a rental of £3,000 a year.

PERSONAL.

Mr. George Price, formerly of the St. Helens Rubber Works and the Gorton Rubber Co., has been appointed assistant works manager at the Northern Rubber Co., Retford. Mr. Scott retains his old post of proofing manager.

ENGLISH PROSPECTS OF SOLID RUBBER TIRES.

A writer in the London "Times" remarks that the increased production of rubber has given us tires suitable for all classes of commercial vehicles at a cost which will permit of their economical use even for light traction engines. The Pickfords and other carriers have recently made some very satisfactory experiments, proving the great durability of solid tires on light machines, some of these tires showing a mileage of several thousand miles.

British imports of automobile tires for the first six months of 1914 reached a value of £1,264,508, against a total for the same period of 1913 of £1,308,288. Exports for this period amounted to £298,652, against £395,985 for the first six months of 1913.

ADDITIONAL AWARDS OF PRIZES AT THE LONDON INTERNATIONAL RUBBER EXHIBITION.

IN the August issue of THE INDIA RUBBER WORLD (page 587) a list was published of the principal prizes awarded in the different competitions at the London Rubber Exhibition. Some additional names having since been received, a supplementary list is annexed.

Owing to the extensive scope of the exhibition awards, those quoted only include first prizes, identified with rubber.

SILVER CUP.

Presented by THE INDIA RUBBER WORLD, New York. For best method of coagulating plantation *Hevea*. Dr. Carlos de Cerqueira Pinto, Pará.

SILVER CUPS.

Presented by Mr. Arthur Lampard. For rubber trade tennis tournament. Mr. A. A. Craigen and Mr. H. E. Mason.

SILVER CUP.

West India Committee Competition. For best sample from an individual West Indian exhibitor. Hill's plantation, British Guiana.

CEARA GOLD MEDAL.

"Tropical Life" Competition. W. Egerton, of Coorg Coffee Co.'s estates, Coorg, Southern India.

MR. JOHN McEWAN'S CUP.

For best exhibit wherever produced. R. D. Greenhill, manager of Highlands & Lowlands estate in Federated Malay States.

MR. THOMAS NORTH CHRISTIE'S CUP.

For best exhibit produced in Ceylon. J. Farley Elford, Kintyre Tea Estate Co., Limited, Ceylon.

MR. E. L. HAMILTON'S CUP.

For best exhibit produced in Federated Malay States or Straits Settlements. P. F. Wise, manager of Balgownie estate in the Federated Malay states.

INTERNATIONAL CONGRESS OF TROPICAL AGRICULTURE.

COVERING in part the same period as the recent International Rubber Exhibition, the International Association of Tropical Agriculture lately held its third congress at the Imperial Institute, London. The meeting was under the chairmanship of the president, Professor Wyndham R. Dunstan, who was assisted by a number of important Colonial officials. Previous congresses had taken place at Paris in 1905, and at Brussels in 1910.

King George V sent a message of welcome and expressed the hope that the discussions would contribute to the advancement of agriculture in the tropics.

In his address the chairman, reviewing the development of tropical agriculture during the last four years, urged the importance of technical education for those called upon to fill responsible agricultural positions in the tropics. Well-trained men holding the diploma of a tropical college would easily find remunerative employment. Ceylon he considered best suited for the location of such a college. The question likewise arose of forming a British Institute of Tropical Agriculture, on the lines of other representative professional bodies.

Among other features of the congress was a discussion of "The Factors Which Determine Variation in Plantation Rubber, with Special Reference to Its Uses for Manufacturing Purposes." Mr. W. A. Williams, of the North British Rubber Co., stated that rubber was given such a working at the plantation mills, that manufacturers could not vulcanize it afterwards. He also complained of planters using chemicals for lightening the color of rubbers.

With regard to standardization, Mr. Spencer Brett (of Messrs. Gow, Wilson and Stanton) said he was convinced the producer of cultivated rubber in the East enjoyed all the conditions necessary for producing qualities more stable in character than any others, provided there was due supervision in every department of collection and preparation. Dr. Schidrowitz recommended manufacturers working towards using plantation rubber without washing. He added that the greatest care was taken in packing tea, which was sold for about 10 cents per pound, while rubber, selling for 50 cents per pound, was simply thrown into a box and had to take care of itself. Sir Edward Rosling suggested blending rubber from different large plantations, in the same way tea was blended, thus arriving at a common standard.

In summing up the president said more facts were required; only to be obtained by laborious research. He considered the time was premature for fixing a standard, it being necessary before doing so to decide what the standard was going to be.

Mr. T. Petch, Government Botanist of Ceylon, read a paper on "The Principles of *Hevea* Tapping as Determined by Experiment," in which he urged tapping experiments being conducted on virgin trees, with a view to obtaining further data. He considered that at present the greatest scope for tapping experiments lay in the direction of "change over" systems, in which different sides of the tree were tapped alternately for periods of two or three months.

Dealing with "The Cultivation of *Hevea brasiliensis* in Uganda," Mr. Samuel Simpson, Director of Agriculture, Uganda, reported that this rubber tree is the one being now most largely planted there, coffee being generally planted as a "catch-crop." He added that the area in Uganda under *Hevea brasiliensis* is increasing more rapidly than that planted in all the other kinds of rubber taken together.

In another paper, on "Diseases of *Hevea* in Ceylon," Mr. Petch stated that though *Hevea brasiliensis* has been cultivated in the East for more than thirty years, it has acquired few diseases; the majority not serious. Other diseases were treated by Mr. E. Ernest Green, late Government Entomologist, Ceylon, and Mr. A. Sharples, Assistant Mycologist, Federated Malay States.

"Increasing the Yield of *Funtumia* by the Sparano Method of Tapping" was discussed by M. Gisseleire, of the Colonial Office, Brussels, who said that *Funtumia* plantations had, as a rule, given unsatisfactory results; the yields being much smaller than those obtained from *Hevea*. Still, as the Congo State has planted a large number of *Funtumia* trees, experiments are being continued, with a view to improving the system of tapping through the method devised by Mr. Sparano, one of the Congo government agriculturists.

Under the head of "Ceara Rubber Cultivation and Manufacture in Southern India," Mr. Rudolph D. Anstead reported that with improved methods of tapping, Ceara has since 1904 been extensively planted in Southern India, where it has been found to respond to good soil and cultivation. Some 17,000 acres are now planted with it. It is believed that in the hill districts with a rainfall of 70 to 80 inches, where *Hevea* will not flourish, Ceara will prove a valuable crop, especially in conjunction with coffee.

Mr. Ashmore Russan, Director of the Soconusco Rubber Plantations, Limited, and London director of La Zacualpa Plantation Co., dealt with present methods of *Castilloa* cultivation in Mexico. He considered their comparative yield shows that *Castilloa* may be more suitable for cultivation in Mexico than *Hevea brasiliensis*, owing to the deficiency of labor.

A resolution proposed by Sir Henry Blake supported the proposed foundation of an Imperial College of Agriculture in the British Tropics and appointed a general committee to co-operate with the London committee which is promoting the establishment of the institution.

THE GERMAN RUBBER INDUSTRY.

WHILE America and England divide the honors of making the first attempts to use rubber industrially, Austria and Germany soon followed. In 1828, Johann Nepomuk Reithoffer of Vienna was granted an Austrian patent for the manufacture of rubber thread, cut out of Para bottles and covered with worsted, silk or wool. A factory was then established by Francois Fonrobert in 1829 at Finsterwalde, near Berlin, for the working of a similar process; this being the start of the German rubber industry.

Scientific rubber investigation commenced in Germany in 1832, when Dr. F. Lüdersdorff of Berlin discovered that rubber, treated at the temperature of 12.25 deg. C. (54.05 deg. F.) with oil of turpentine and sulphur, displayed a notable resistance to light and oxidation. It was, however, reserved for Charles Goodyear to discover and improve the process of vulcanization with sulphur in 1839.

In the year 1846, Werner Siemens, then a German artillery officer, proposed the use of gutta percha for the insulation of telegraph wires, building the first gutta percha press in 1847; while the first submarine cable was laid in 1850 between Dover and Calais by Brett. The first rubber shoe factory in Germany was that established in 1850 at Mannheim by the Etablissements Hutchinson, a Paris concern, of American personnel.

PROGRESS OF GERMAN RUBBER MANUFACTURE.

A notable discovery of that period was that of the manufacture of hard rubber, by Nelson Goodyear, that process being employed in America by Meyer & Poppenhusen, branch of the German firm, H. C. Meyer, of Hamburg. In 1856 the first German hard rubber factory was established, that of the "Harburg Rubber Comb Co.," now Dr. Heinrich Traun & Sons. The same year witnessed the installation of the rubber shoe factory of Albert & Louis Cohen, now the "United Harburg-Vienna Rubber Factories"; this combination also including the Austrian Reithoffer factory.

Notwithstanding these successes, progress in Germany was slow until the foundation of the German Empire in 1871, the effects of which were experienced in a marked development of the industry. This has been noteworthy during recent decades in the development of the tire and airship industries, under the additional influence of various important consolidations.

Statistics of German rubber goods manufacture show that from 36 concerns in 1861, with 1,788 workers, it gradually attained the following dimensions:

1875,	120 establishments	with	5,635 hands
1882,	243 "	"	8,975 "
1895,	450 "	"	16,366 "
1907,	539 "	"	31,909 "

Since 1907 official figures of the number of factories are wanting, but according to the estimate of the "Gummi-Zeitung" there are now about 150 important concerns, in addition to a large number of small ones. Of greater importance are the estimates of the increase in the number of hands employed, from 31,909 in 1907 to 40,000 in 1911 and to 45,000 at the present time. According to the census of 1907, 23,347 horse power was then used in 252 out of the 539 factories. The mechanical equipment at that time included 8,837 machines.

The results of 33 important rubber goods manufacturing companies for 1912 showed that 25 of them made profits, and that an average dividend of 12.3 per cent. was distributed in 22 cases; the lowest rate being 2 to 3 per cent. and the highest 25 to 50 per cent. The aggregate capital of the 33 companies equaled $20,943,500.

Among special new features of German production during the last half century were: in the "sixties"—asbestos goods, hose, ice bags, air cushions and rubber balls; in the "seventies"—rubber stamps, bicycle tires and belting; in the "nineties"—rubber toys, rollers, seamless and cut goods, garments, automobile tires and balloon materials, as well as regenerated rubber. Sundries have also constituted an important section of German production

EXPORTS OF GERMAN RUBBER GOODS.

Exports of German rubber goods for a series of years equaled: 1889, $5,663,750; 1899, $13,590,000; 1909, $13,792,500; 1910, $16,713,500; 1911, $18,529,000; 1912, $31,351,000; 1913, $32,500,000.

The principal foreign outlets for German rubber goods were in 1910: Great Britain about $3,500,000 (largely sheet rubber in conjunction with fabrics, hard rubber goods, textiles with rubber threads, and insulated wire); France, about $1,250,000 (to a large extent hard rubber and rolled sheets of soft rubber; Italy, about $1,000,000, and Austria-Hungary a like amount. Among the nations consuming German rubber manufactures is also Switzerland, which takes about $1,000,000 worth of sheet rubber combined with fabrics and textile goods in the piece, coated with rubber.

CONSUMPTION OF RUBBER.

The consumption of crude rubber in Germany, as shown by the difference between the imports and exports, was: 1889, 3,329 tons; 1899, 8,295 tons; 1909, 18,117 tons; 1910, 23,179 tons; 1911, 23,534 tons; 1912, 19,249 tons; 1913, 18,833 tons.

GERMAN COLONIAL RUBBER.

Supplies from the German colonies have been as follows:

		German East Africa	Togo	Kamerun	German New Guinea	Samoa	TOTAL
1891.....	*tons*	189	53	377	—	—	619
1909.....		474	147	1,518	—	—	2,139
1912.....		754	166	2,541	3	9	3,473

These figures, it is remarked, show the increasing supplies received by Germany from the African colonies of that country. It was estimated in 1910 that about 60,000 acres had been planted with rubber at various points.

LABOR CONDITIONS.

The peaceful and harmonious relations existing in the German rubber industry between employers and employed are illustrated by the large number of workers who have celebrated their silver jubilee, while a much larger number have been awarded bronze medals for ten years' service. Workmen's insurance and various pension fund arrangements have been largely carried into effect, while workers' dwellings are prominent features of the system in force. Strikes and other forms of labor disputes are thus rare in the German rubber industry; there being a mutual recognition of the fact that successful results are only to be achieved when satisfaction exists on both sides, with due regard to the enforcement of the discipline necessary in large plants.

In the opinion of competent observers the German rubber industry is resting on a secure foundation and is well equipped for meeting competition with its rivals in foreign countries, the attainment of the highest possible capacity of its manufacturing plants forming its most important object. This aim it hopes to reach through the technical knowledge, perseverance and enterprise which have marked its efforts in the past.

SPECIAL RUBBER GOODS FOR THE SUMMER SEASON.

German manufacturers are giving particular attention to rubber goods suitable for use in the usual summer outings—such as bath accessories, for instance, for the older people, and toys which children can use at the beach. One article in particular might be mentioned—a seat made of rubberized material for protection—to ward off rheumatism—when people are sitting on the wet sand or damp ground. This rubberized seat is thin and light, and can easily be carried in the pocket.

Some Rubber Planting Notes.

DR. ARENS' JOURNEY OF RUBBER INVESTIGATION.

THE last number of the "Mededeelingen," or "Cummunications" of the Testing Station at Malang, Java, contains an interesting account of the journey undertaken last spring by Dr. P. Arens, the assistant director of rubber cultivation. At the meeting of the Testing Station on February 25 it was decided to send Dr. Arens on this tour of inspection, from which he returned in the early part of the summer.

His object being to collect information of value to Java planters, three weeks were allotted to Ceylon, conditions in both islands being similar and planters in both cases suffering under the same disadvantages. Hence the records and impressions of his visit to the last named island occupy a prominent place in his report, the comparison between Ceylon and Java being constantly in view. Other portions of his narrative deal with Sumatra, the Malayan peninsula and other centers of interest.

The information gathered with regard to the different countries visited affected systems of cultivation, catch crops, manuring, destruction of insects, tapping, renewal of bark, preparation, smoking, etc. Special attention was likewise devoted to the sorting and packing of rubber, while the natural features of the respective countries are also referred to in connection with their influence on its growth.

THE TREUB LABORATORY AT BUITENZORG, JAVA.

The opening early this summer of the new Treub Laboratory at the Botanic Gardens, Buitenzorg, Java, has recalled the connection of Dr. Melchior Treub with that institution, which had lasted since 1880, when he was appointed director. He had up to that time devoted close attention to nature in its various forms, both abstract and concrete.

He then invited a noted German scientist, Professor H. Graf zu Solms Laubach, of Göttingen, to assist him. This expert remained at Buitenzorg from October, 1883, to March, 1884. As a result of these joint efforts, the "Foreign Laboratory" was opened in May, 1885. During the first years the laboratory was under the special control of Dr. Treub himself, but when in 1890 Dr. M. Janze became attached to the Botanic Gardens as botanical expert, Dr. Treub gave him immediate charge of the laboratory.

In 1887-1888 Dr. Treub succeeded in obtaining a grant from the Amsterdam Royal Academy of Science; the interest of which fund was devoted to sending every two years a botanical expert to Buitenzorg. The first of these was the well-known Professor Went. In the course of years many botanists journeyed to Buitenzorg to continue their studies and investigations.

In 1905, after a quarter of a century's service, Dr. Treub was promoted to the post of Director of Agriculture in Java, which he held until 1909. His death occurred in 1910.

While in his late life he had less to do with pure science, yet it always occupied the first place in his thoughts.

The decision to erect a new and suitable laboratory as a memorial to him was taken on Dr. Treub's death on October 3, 1910, but has only just been carried into effect.

PLANTATION RUBBER ACREAGES.

A South Indian estimate shows the following acreages under plantation rubber in 1913: Malaya, etc., 500,000; Java, 150,000; Sumatra, etc., 250,000; Ceylon, 220,000; India and Burma, 50,000; German Colonies, 60,000; Borneo, 20,000; total, 1,250,000 acres. The totals for previous years were: 1910—767,000; 1911—865,000; 1912—987,000. It will thus be seen that the increase shown by 1913 over 1912 is about 27 per cent.

JAVA RUBBER EXPORTS.

Official statistics show the following comparative rubber exports from Java and Madura:

	January-April.	
	1913	1914
Hevea .....*tons*	607	1,147
Ficus	31	23
Ceara	1½	15½
Castilloa	13½	17
Other classes	30	8
Gutta percha (plantation).....	4½	15
" " (pressed leaves)...	198	225
Jelutong	13	11

RUBBER PLANTING IN MALAYA.

The following statistics illustrate the relative importance of the rubber acreage in various parts of the Malayan Peninsula:

	1912. Acreage.	1913. Acreage.	1913. Output in Tons.
Federated Malay States.....	399,197	433,324	21,229.17
Straits Settlements	94,263	111,316	6,047.14
Johore	91,827	117,022	1,645.70
Kelantan and Kedah.....	34,837	45,373	246.18
Trengannu	1,497	1,510	Not yet producing
	621,621	708,545	29,168.19

In 1912 there were in all 255,912 workers employed on the Malayan estates; the number having increased by 1913 to 282,354.

DUTCH-INDIAN IMPORT TRADE.

In addressing the Dutch Commercial Association, during the recent summer meeting at Zwolle, Holland, Mr. D. Ilde Vries stated that the population of Java, now over thirty millions, is increasing at the rate of half a million a year. Sumatra is also rapidly developing, with further development expected on the completion of the railway now under construction, which passes through a fertile district. A small portion of this line is already in operation.

The amount of imports into Dutch India for the last few years equalled in millions of dollars: 1907, 99; 1908, 112; 1909, 113; 1910, 138; 1911, 160. The speaker urged this development as indicating the growing importance to Europe of the Dutch Indian markets.

RUBBER COMPANIES IN SOUTHERN INDIA.

By the courtesy of the Department of State at Washington a tabular statement has been received showing the history of some 19 South Indian sterling companies and 4 rupee companies.

Taking them in the order of the annual quantity produced, the most important concern is the Rani Travancore Rubber Co., Limited, registered in 1910 for the purpose of taking over about 3,600 acres, of which about 3,000 acres have been planted with Pará rubber. The yield for the year 1913 was 513,813 pounds, produced at about 1*s.* 3⅛*d.* (31.16 cents) per pound f.o.b.; the estimate for 1914 being 675,000 pounds. The Malayalam Rubber & Produce Co., Limited, for 1913 yielded 263,664 pounds of rubber, and estimates the current year's product at 482,000 pounds; while the Travancore Rubber Co., whose output for last year was 123,083 pounds, anticipates for 1914 about 150,000 pounds.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

RUBBER CULTIVATION IN BURMA.

By C. G. Williams, Rangoon.

THE rubber growing districts are Lower Burma, including Tenasserim, which is subdivided into smaller districts e. g., Amherst and Maulmain, Attaran, Lower Mergui, Tavoy and Victoria Point, some 200 miles further south.

The soil is principally a light or dark reddish yellow friable sandy loam, with occasional districts which have a subsoil of laterite. The ground is slightly undulating and in nearly all cases is protected from the southwest monsoon by high ranges of hills varying from 700 to 1,000 feet. The land is easily drainable.

The rainfall varies slightly in different districts. The yearly average is as follows:

Tenasserim North	110 inches.
Maulmain and Amherst	150 "
Attaran	180 "
Mergui	120 "
Tavoy	200 "
Victoria Point	160-180 "

There are two seasons: December to April, the dry or cold season, and May to November, the wet or monsoon season. There is no fear of a prolonged drought. The driest months are February and March, when there is very little or no rain—say about 2 inches per month; but there are heavy Scotch mists and dews which compensate for the lack of rain. The climate in all districts is very healthy, more so than in the Malay States, the temperature being 88.8° F. in the day time (midday) and 74° F. at night—the mean temperature for the year being about 80° F.

Labor is principally Indian. Koringhis and Ovriyas are very plentiful. Burmese and Chinese contractors are usually engaged for felling, etc. The scale of pay is about half the price paid in the Malay States, varying from $4 to $5 United States gold. The highest rate is $7 gold per month. This is in Victoria Point, the extreme south end of Burma.

Land is granted for a lease of 30 years, with a renewal of 20 years, as well as 8 years' exemption from taxes. No fixed tax has been levied as yet by the government. The matter is under discussion among the planters' associations.

The growth of trees is excellent, quite as good in every way as in the Malay States. All trees can be tapped in 4 years from date of planting, the girth average 3 feet from the ground being 18 to 24 inches and more if planted 20 x 20 feet. There are trees 15 years old having a girth average of 60 to 80 inches, and some trees 35 years old 80 to 90 inches and over, yielding 12 to 15 pounds per tree per year; the average yield for 4 year to 6 year-old trees being 1½ pounds to 3 pounds per tree per year. The rubber produced is diamond pattern, sheet or biscuit (smoked) and blanket crêpe (smoked). The sheets are even, of uniform color and excellent quality.

Tapping can be done now practically all the year round by using patent gutters placed over the vertical channel and oblique cuts. It is principally done by Burmese girls, as they are not migratory like other classes of labor, and are cheaper and more satisfactory.

All planting is stump planting about 9 months to 1 year old. The plants attain a height of from 10 to 12 feet and a girth average of 2½ to 4 inches in one year from date of planting.

Transportation is fairly good in all districts. Those near the coast have fortnightly steamers running to Rangoon. Inland, the communication is by carts or boats to the railway.

Capitalization is from £22 sterling to £25 per acre to bring to bearing, say $110 gold to $125 or $130, the latter price being at Victoria Point, where labor is dearer—whether contract or otherwise. Maulmain and Tenasserim are the cheapest. The total acreage under cultivation, including native holdings and private estates, is about 34,000 acres.

The following is an extract from a report by Mr. A. B. Milne of Malay States fame: "Each successive trip to Lower Burma serves to increase my opinion of that country as a rubber producer, the rubber produced being the best hand made, second grade rubber I have yet seen. The clearings have exceeded my most sanguine expectations and are remarkably good in comparison with the Federated Malay States." Mr. Maurice Maude has also visited the country and expressed his opinion about its suitability for rubber cultivation. The average cost of production is about 1*s.* 6*d.* to 1*s.* 10½*d.* (36.49 cents to 45.61 cents) per pound.

REPORT OF GOLD COAST GOVERNMENT FOR 1912.

ACCORDING to the latest report of the Gold Coast Government—for 1912—applicants during the year received of Para rubber 39,407 plants and 347,890 seeds, and of *Funtumia* 1,560 plants and 900,000 seeds. The distribution of Para rubber seeds showed a marked increase on that of the previous year, and it was anticipated that larger supplies of Para plants would thus be available during the next season. The total quantity of rubber sold was 2,808 pounds, realizing an average of about 4*s.* 3*d.* (103.38 cents) for sheet. Exports of rubber, however, showed a very large decline.

Fair progress continues to be made by the Para rubber on the several experimental stations, the average annual yield of 30 trees at four centers being 3¼ pounds per tree, or nearly half a pound more than in the previous year. The yields from *Funtumia*, though limited through a misunderstanding, were among the best yet obtained from experimental tappings on cultivated trees and are considered to give promise of better returns as the trees increase in age. The *Funtumia* has given over 56 per cent. of its total yield at the first tapping, in contrast with Para, where the quantity of latex tends to increase after the first tapping, this development being known as "wound response."

European plantations were making fair progress, the Para rubber growing rapidly, but *Funtumia* showing only a slow rate of growth. The planting of the latter variety on cocoa farms is becoming quite general in the central province of Ashanti, but no progress has been made in tapping the trees and preparing the rubber for market.

Besides the report of Mr. W. S. D. Tudhope, Director of Agriculture, separate reports in the form of appendices were submitted by the Government entomologist, the traveling inspector and the agricultural stations of Aburi, Tarquah, Coomassie, Assuantsi, Tamale and Kibbi.

The following table shows the exports of rubber from the Gold Coast Colony during the ten years, 1903-1912:

Years.	Pounds.
1903	2,258,981
1904	4,013,837
1905	3,633,106
1906	3,649,668
1907	3,549,518
1908	1,773,243
1909	2,764,190
1910	3,223,265
1911	2,668,667
1912	1,990,699

Mr. Tudhope expresses the opinion that it will be some years before much rubber will be produced on native Para plantations.

NEW AGRICULTURAL SCHOOL IN JAVA.

In addition to the existing agricultural schools at Wonosobo, Poerworedjo, Soreang and Ploembon, a new school of that character is projected for Poerwokerto. Funds have been donated by the Resident at Banjoemas, who has given the equivalent of $12,800 towards the establishment of the school, instruction at which will be of a special character.

RUBBER IN FRENCH INDO-CHINA.

FRENCH Indo-China includes Tongking, Annam, Cochin-China and Laos, acquired by France through conquest, as well as Cambodia, Angkor, Battambang and Kouang-teheou-Wan, ceded under diplomatic agreements. Cochin-China is a colony of France (capital Saigon), while the other states of Indo-China are protectorates of that country.

Cochin-China has a more extensive cultivation of rubber than any of the other portions of French Indo-China, lying chiefly between 8 degs. and 12 degs. north latitude, and from 101 degs. to 105 degs. east longitude. Within the last twenty years the natural healthfulness of the country has been further improved through the works of sanitation executed by the French authorities, which fact has encouraged colonists to remain there, instead of returning to France. Cochin-China is subject to the influence of the monsoons, and has a rainy season from May to October, followed by a dry period. It is watered by the Mekong, a river 2,000 miles in length, with numerous tributaries. The country is divided into three sections. In the southern and western portions the land is low, while to the east is a slightly more elevated district suited for rice, tobacco and cereals. The far eastern and the northern portions have distinctly higher lands not inundated in the rainy season, where rubber is grown in the gray and red soils.

According to the latest number of the "Annals of the Rubber Planters of Indo-China," published in connection with the London rubber exposition, the native population is descended from Annamite immigrants, and has perpetuated their national characteristics of obedience to authority and respect for foreigners speaking their language.

From the reports brought back from Europe by residents of Cochin-China there seems to be an impression that the *Hevea Brasiliensis* could not grow in the last-named country. It is admitted that Cochin-China has been outstripped in this matter by Ceylon, Java, Sumatra and the Malay peninsula. This situation is attributed to the fact that those countries had not the resource furnished by rice in the case of Cochin-China, which was developed without regard to rubber and other remunerative forms of cultivation that had received attention in neighboring countries. On this point there seems to have been a lack of encouragement on the part of the government, which obtained a satisfactory revenue from rice.

Rubber was planted at a relatively early date by M. Belland, a French colonist, who from a modest plantation of 15,000 trees realized in 1910 (the second year of his tappings) a net profit of nearly $20,000. This fact encouraged many Frenchmen to take up the cultivation of *Hevea Brasiliensis*. The commencement made in 1907 and 1908 by the Suzannah and Xatrach estates was followed by the establishment of many small companies. These companies were in most cases founded with the savings of colonists and their plantings varied from 10,000 to 50,000 trees each. Cochin-China is the land for the small planter. European capitalists are moreover now taking interests in plantations. Both European and native planters have taken up *Hevea Brasiliensis*.

The north and northeast of Cochin-China (already referred to as being favorable for rubber) contain a vein of gray and red clay about 70 miles long by 25 miles wide, forming an ideal rubber country. Results obtained from planting in these soils have been satisfactory in both cases. The estate of M. Belland and the government agricultural station of Ong-Zem, which produced the first rubber from Cochin-China, are on gray soil, while the others named are on red clay.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

NOTES FROM DUTCH GUIANA.

By Our Regular Correspondent.

IT is rumored here that a French combination with headquarters at Paris has formed a company to exploit certain wild rubber tracts situated in the Para district of the colony, and that the capital to be invested is 5,000,000 francs ($965,000). These lands have long been in the market, and at one time stood a good chance of becoming the property of an American concern, but the sudden and unexpected change in rubber prices damped their ardor, and they let go. From the prospectus issued by this company we gather that the tract contains 150,000

COLONIAL RAILWAY PASSING THROUGH WILD RUBBER AND BALATA TRACTS, DUTCH GUIANA.

acres, situated in the neighborhood of the Colonial Railroad, which will greatly facilitate transport and render the opening up of the tract inexpensive.

In my last correspondence mention was made of the waiting game of the planters; and their policy is not to be criticised when it is considered that by waiting a few years longer the returns of rubber per tree will be almost doubled.

In dealing with the rapid growth of rubber trees in Dutch Guiana, Professor J. B. Harrison, Director of Science and Agriculture, on a recent visit to Surinam said he was amazed to see how the rubber trees had grown. At plantation Mengenstand he found trees with a girth of from 55 to 60 inches which he saw in 1910 when they were just taken from the nurseries and planted. Professor Harrison was no less pleased to see the healthy and flourishing condition of the cocoa and coffee trees on this estate as well as on others he visited during his brief stay in the colony; and on his return to Demerara he was not silent regarding his impressions of rubber, cocoa and coffee in Dutch Guiana. It ought to be now recognized by all that the soil, climate and rainfall in Surinam are all that can be desired for the cultivation of rubber and other tropical products.

Balata has been brought into town in quantities, the largest parcels arriving during the past few weeks, and the customs have reported a production of 198,650½ kilograms (437,031 pounds) to June 30, 1914, as against 195,713 kilograms (430,569 pounds) for the same period in 1913. The weather still continues favorable for operations and by the end of September the 1914 crop will have been gathered.

In the month of June alone the balata produced was 71,419 kilograms (157,122 pounds), as against 55,081 kilograms (121,198 pounds) in June, 1913. It is a well known fact that a less number of bleeders are operating this year, owing principally to the strict and correct contracts they are called upon to enter into, and the reduction in advances.

The Chamber of Commerce in its annual report, dealing with the balata industry says: "The receipts in the towns were higher in 1913 than in any previous year, despite the fact that

prices were lower, as is shown in the table hereto annexed:

1913.	Local Price per Kilo. (2.2 Pounds.)	New York Price per Pound.
January	3.85 florins	$0.72
May	3.60 "	0.66
July	3.12½ "	0.60
September	2.75 "	0.55@0.56
October	2.92½ "	0.57@0.61
November	2.90 "	0.64@0.67
December	3@3.30 "	0.62@0.66

Since January, 1914, the price has been rising The shipments are made chiefly to Holland, which takes 57 per cent. of the total. British countries receive 23 per cent. and the United States 17 per cent. The quality has suffered from the drought of 1912 but is improving slowly and surely."

It is interesting to report that the United States took from this country in the year 1913 produce amounting in value to 3,396,037 florins ($1,358,414), against 3,749,045 florins ($1,499,618), the value sent to the mother country. Great Britain received Surinam products valued at 1,119,707 florins ($447,882). The United States alone is responsible for 93 per cent. of the cocoa crop of Dutch Guiana, and this accounts for the better market there compared with prices at Amsterdam and in France, which take only 3 per cent. each of bulk of cocoa exported from the colony.

NOTES FROM BRITISH GUIANA.

By Our Regular Correspondent.

WEATHER CONDITIONS: BETTER EXPORT FIGURES.

THE weather conditions during the past month have on the whole been very favorable for the balata industry. Although signs are not wanting that the rainy season is coming to an end, we are still experiencing some refreshing rains. The short rainy season was conspicuously brief again this year and the long rainy season came so late as to cause some misgiving, but when it did come it was found to bear a greater similarity to the traditional rainy season than has been the case for some years, and during the past three months the rainfall has been persistent and abundant. Reports from the Rupununi district, where a large proportion of our balata is now secured, are consequently encouraging. One superintendent alone estimates that he will get a return of 200,000 pounds, providing that the men are prepared to work. Up to July 30 the exports from this district have been 379,661 pounds, as compared with 299,165 pounds last year. These are the latest figures published.

THE CONSOLIDATED REPORT: FOOD FOR THOUGHT.

The annual report of the Consolidated Rubber & Balata Estates, Ltd., has been received here with mixed feelings. The company is carrying on operations in the colony on a large scale, and if it were to withdraw the importance of the balata industry would sustain an appreciable diminution; consequently the fact that there was no profit to provide for writing down the assets, especially preliminary expenses, has caused some misgiving. It was explained at the annual meeting that the large profit anticipated had been completely extinguished owing to the unexpected fall in the price of balata, but one of the shareholders pointing out that the price of balata in England was in excess of that obtained by the directors, a Committee of Inquiry was appointed. The important point was the announcement that the local manager, A. F. White, had reduced the cost of production to 49 cents per pound, as compared with 60 cents in 1912 and 73 cents in 1911. It was contended that if the market price had been obtained by the directors a difference of $115,000 would have resulted, and had not the cost of production been reduced by prudent management and organization locally, the company would have come out very badly on the wrong side. Forty-nine cents is a fairly low cost of production when it is recollected that many of the company's grants lie so far in the hinterland. By the construction of a frontier railway this cost will be still further reduced. It is the cost of transport—the slow progress made over long distances, on account of the difficulties of navigation in our cataract-studded rivers—that leaves such a narrow margin of profit for our balata corporations.

THE HILL'S ESTATE: TEMPORARY SUSPENSION OF OPERATIONS.

Some consternation was caused locally by the announcement that the Bartica Agricultural Estates, Ltd., had temporarily suspended operations at the Hill's Estate owing to the failure of the sisal hemp cultivation, because this plantation represents about the most promising experiment in rubber cultivation that the colony has yet to show. A considerable acreage is under cultivation and all the rubber is reported to be in a flourishing condition. It is hoped that when this estate makes good it will be the means of inducing other capitalists in the United States, and elsewhere, to try their fortunes with this colony's undoubtedly great possibilities. The report, however, was soon forthcoming that the suspension of operations was likely to be brief, and that it related only to the extension of the cultivation, which ceases for the present. The trees on the 750 acres under rubber are in good condition with regard to height, girth and freedom from grass and weeds. On a few hundreds of these 750 acres the trees are already tappable and the yearly returns are most satisfactory, comparing very favorably with those obtained in other countries. The trees on an area of over 400 acres have been felled, and as soon as the season is favorable for the purpose the clearing and stocking of this area will take place by way of preparation for the reception of the plants. There is also in connection with the Hill's Estate a beautiful nursery, containing more than 70,000 seedlings of the *Hevea brasiliensis*, which will be used in the planting of the area under preparation.

THE RUBBER EXHIBITION: PRIZES FOR THE COLONY.

The colony enjoyed a considerable success at the recent Rubber Exhibition held in London. The British Guiana stall was generally admired and it received the West India Committee's prize for the best comprehensive exhibit of a Permanent Exhibitions Committee, while the Hill's Estate won the West India Committee Silver Cup for the best sample of rubber by an individual exhibitor. Mr. Algernon Aspinall, writing to Professor Harrison, Director of Science and Agriculture, says: "Your stand was undoubtedly the finest. A notable feature was the exhibits of products on a commercial scale. The whole tone of the exhibit was admirable. Next time you must make a still larger display. British Guiana is a colony which should really benefit from partaking in these exhibitions." Mr. C. W. Anderson, Forestry Officer, the colony's Commissioner at the Exhibition, writing to the Professor, said that the visitors' book of the West Indian Courts kept in the British Guiana Court was signed on the opening day by His Royal Highness Prince Arthur of Connaught, who expressed his interest in the exhibits and particularly in the balata exhibits, stating that he had often heard of the product but never before had seen it. The Lord Mayor of London paid a visit in state to the Exhibition on the 26th of June and signed the visitors' book. The Exhibition will do the colony much good in the outside world and will emphasize our mistake in failing to send a display to the New York Exhibition. A very comprehensive exhibit is being sent to the Toronto Exhibition, including sugar, cacao, coffee, rice, rice meal, rum, cocoanuts, cocoanut oil, molasquit, kola, cassareep, castor oil seed, balata, rubber, and arrow-root. The balata exhibit includes 108 pounds by the Department of Lands and Mines, and the rubber exhibit samples from the Issorora Rubber Station of the Onderneeming School farm.

EUROPE'S DESOLATION AMERICA'S OPPORTUNITY.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

Dear Sir: In the midst of the most tremendous, devastating and inexcusable war that the world has ever known, it seems shocking to persons of refined spirit that any of us should be thinking of how its existence may turn to our personal advantage. But the war is not of our making. It has inflicted and will yet inflict upon us losses which cannot be escaped. It has inflicted upon other neutral nations great losses of commerce. The losses of these nations, as well as our own, may be modified by increased commerce between them and us. Other nations, having wildly rushed to war, the need for the goods they no longer can supply must be met by ourselves and other neutral peoples.

There is no harm, but both reason and duty in our making the present an occasion for extending our commerce with both belligerants and neutrals. It is not to be forgotten, moreover, that our diminished prestige on the sea dates from the time when our own land was torn by the horrors of civil war. Our ships were swept from the sea and a system of high duties, for the express purpose of discouraging imports, was made a part of our fiscal policy. European traders rushed in to take the advantage we had lost and they retained it until the day that Germany launched her thunderbolts of war.

Not in bitterness, but with justice, we recall that throughout Europe our great misfortune was welcomed as "marking the end of the republican experiment." Our own sentiments, in the midst of the horror which is now shaking the world, are those of profound grief. No American, worthy of the name, can feel otherwise. But our European brothers have abandoned peaceful commerce for the dangers of war. Their trade is derelict. Humanity, as well as self-interest, requires that Americans should do their part to see that the commerce of the world shall still go on.

T. M. U.

OXIDE OF IRON PAINT IN METAL WORK.

The Westmoreland Chemical & Color Co., of New York and Philadelphia, received a little while ago a communication from C. S. McNally, a contracting painter, in which he gives his opinion of oxide of iron paints (which are manufactured by this company) in the following paragraph.

"It is my opinion that if oxide of iron paints were more generally specified for the painting of steel structures today, in place of many of the compounds and mixtures that are used, the problem of preservation would be much nearer solution and at a decidedly lower cost."

RUBBER NOT CONTRABAND OF WAR.

According to article 28 of the general agreement at the London Naval Conference, rubber is one of the articles which cannot be declared contraband of war—that is, unless more than one-half of the cargo of the vessel in which it is being transported shall consist of contraband.

Articles of interest to the rubber trade which come under the contraband class are balloons and air craft of all kinds, their component parts and all accessories and articles recognizable for use in connection therewith, also clothing, fabrics for clothing and boots and shoes suitable for use in war.

A report comes from an American consul at Bradford, England, that a new method of waterproofing fabrics has been placed on the English market. Among the advantages claimed for it are that it requires no special machinery, stands any heat for finishing purposes and does not alter the feel of the material while rendering it impervious to moisture. Samples of cloth treated by the process may be had from the Bureau of Foreign and Domestic Commerce, Washington.

THE SITUATION IN MEXICO.

AN American who has resided in Mexico for many years and been successful in his operations there, including rubber planting, was obliged some months ago to leave his plantations and go to Vera Cruz, where with many other refugees, he could be under the protection of the American flag. The following description of the Mexican outlook taken from a letter addressed to the editor of THE INDIA RUBBER WORLD and received a few days ago, is highly interesting, as it comes from a man whose familiarity with the Mexican situation should enable him to form an accurate opinion:

"Politically and economically the country has reached the depths of degradation and ruin—treason in high and low places—political dishonesty, and so on down to savage murder, rapine, torture and pillage. *Non, si mihi sint centum linguae centumque ora et vox ferrea possim comprendere omnes formas scelerum* (If I had a hundred tongues, a hundred mouths and a voice of iron, I could not enumerate all the different forms of crime) that have been committed here in the name of liberty; and worst of all one is driven to the conclusion that there is no choice in sides, whether it be Federal or Rebel, or, as the latter please to insist, Constitutional. This is not the opinion of a day. A score of years went to its making. It is idle to talk about unaided reconstruction, regeneration by free or voluntary effort upon the part of the people. The trouble is, there is no standard of ethics to work by, or if there be, the racial temperament is not equal to the strain. Many have said it is owing to lack of literacy. Don't think it; the percentage of literacy—perhaps 20 per cent. of the whole population—is notorious for its crimes; 20 per cent. more would only increase the problem, as the really most trustworthy is the pure Indian untainted by contact with the educated. The point is, literacy is not directed to the proper ends—merely an engine for more clever machinations, both in social and political life—and I repeat, unaided there is no hope within human possibilities.

"This means direction for a series of years by some force capable of insuring compliance with any form of government set up here. That it must be an exterior force is obvious. Who is going to do the job? Merely moral persuasion from Washington intensifies the detestation felt by nearly all Spanish America for the United States. The opposite is wonderfully evident in Vera Cruz, where at the time of occupation and for a short time afterward you could not conceive of a more wild, frenzied, gesticulating lot of lunatics cursing and damning the hated 'Gringo.' Today all is order, peace, justice, discipline; good money in circulation, and practically everybody happier than they have ever been in their lives—saving a few rich harpies, whose wings have been clipt. Fines for misdemeanors are levied and collected impartially. That is a revelation to Mexicans. In other words, their literacy is truly directed to the proper end, but, as you see, force is at the back of it and, more to the point, right in the spot; so we all sadly enough look forward to the day—we fear all too soon—when it will be removed."

ASBESTOS PRODUCTION.

The report of J. S. Diller of the United States Geological Survey on the production of asbestos in 1913 gives the output of the United States as 1,100 short tons. According to this report, the area opened up in Arizona during the year is producing a remarkable fibre, which, when twisted into yarn 0.03 of an inch in thickness, will support a weight of 15½ pounds. It is also said to be superior for insulation purposes, its iron content being somewhat lower than the asbestos of Canada—where most of the world's supply of this mineral is obtained—which is found in serpentine rock derived from peridotite, whereas the Arizona asbestos is associated with limestone.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED JULY 7, 1914.

NO. 1,102,406. Vehicle wheel. W. C. Hofen, San Francisco, Cal.
1,102,423. Cushioned wheel. G. T. McMillan, Bushnell, S. D.
1,102,487. Treatment of caoutchouc, gutta percha, and like substances. L. Feval and J. De La Fresnaye, Paris, France.

1,102,598. Non-skid vehicle wheel. J. Liska, assignor of one-half to A. Klapan—both of Natrona, Pa.

1,102,630. Composition, and process of manufacturing the same. J. W. Aylsworth, East Orange, N. J., assignor to Condensite Co. of America—both of Glen Ridge, N. J.

1,102,631. Plastic composition and method of making same. J. W. Aylsworth, East Orange, N. J., assignor to Condensite Co. of America, Glen Ridge, N. J.

1,102,632. Enamel lacquer or varnish composition. J. W. Aylsworth, East Orange, N. J., assignor to Condensite Co. of America, Glen Ridge, N. J.

1,102,633. Insulating composition. J. W. Aylsworth, East Orange, N. J., assignor to Condensite Co. of America, Glen Ridge, N. J.

1,102,634. Plastic phenolic condensation product and process for forming the same. J. W. Aylsworth, East Orange, N. J., assignor to Condensite Co. of America, Glen Ridge, N. J.

1,102,690. Vehicle wheel tire. I. M. Sartain, Tracy City, Tenn.

1,102,789. Apparatus for cutting, grinding, mincing or pulverizing rubber. J. Ogden, Manchester, assignor to A. Denton, Ingleside, Marple, county of Chester—both in England.

1,102,811. Elastic tire for vehicles. J. Spyker, Amsterdam, Holland.

1,102,860. Tire for wheels. W. H. Blake, Jersey City, N. J.

1,102,914. Supplemental tire for vehicle wheels. C. Hastings, Atchison, Kan.

1,102,938. Blow-out patch. J. H. Marvil, of V. & I. H. Downs, Laurel, Del., assignor of one-third to J. D. Marvil and two-thirds to S. D. Marvil, Laurel, Del.; S. L. Marvil and F. B. Sirman executors of the estate of said J. D. Marvil, deceased.

1,102,939. Tire repair patch. J. H. Marvil, of V. & I. H. Downs, Laurel, Del., assignor of one-third to J. D. Marvil and two-thirds to S. D. Marvil, Laurel, Del.; S. L. Marvil and F. B. Sirman executors of the estate of J. D. Marvil, deceased.

1,103,003. Detachable wheel rim. R. Haupt, Hanover, Germany.

Trade Marks.

70,348. Estate of C. F. Goepel, New York, N. Y. The words *Established Quality* and *Efficiency* in a fancy design. For rubber buttons.

70,658. Gem Fountain Pen Corporation, New York, N. Y. Representation of a fountain pen in a sunburst. For fountain pens and the parts thereof.

70,659. Gem Fountain Pen Corporation, New York, N. Y. The word *Gem*. For fountain pens and the parts thereof.

71,081. Woonsocket Rubber Co., Woonsocket, R. I. A cameo representing a head. For rubber boots and shoes.

76,579. The Eagle Kant-Slip Patch Co., Cleveland, Ohio. An illustration of an eagle carrying a tire in its claws. For rubber adhesives, patches, etc.

76,707. Rubber Sundries Co., Cleveland, Ohio. A diagonal black band on which the words *Black Band* appear in a circular space. For rubber water bottles, fountain syringes and ice caps.

77,957. C. J. Higley, New York, N. Y. The word *Haley*. For hose supporters.

78,561. Mulconroy Co., Inc., Philadelphia, Pa. The words *Safety-First*. For hose fittings.

78,846. Revere Rubber Co., Providence, R. I., and Chelsea, Mass. The words *Spring-Step* in a semicircle. For rubber soles for boots and shoes.

78,907. Hood Rubber Co., Watertown, Mass. The word *Seaside*. For rubber boots and shoes and rubber soled shoes.

ISSUED JULY 14, 1914.

1,103,114. Rubberized silk supporter. J. Warren, McComb, Ohio.

1,103,148. Lady's skirt with elastic plaited part. A. Malsin, New York, N. Y.

1,103,181. Braiding machine. W. E. Elliott, Grand Rapids, Mich.

1,103,280. Beating engine. R. S. Fram, Vandalia, Ill.

1,103,308. Vehicle wheel. F. H. Messinger, New York, N. Y.

1,103,349. Fountain pen. W. L. Chapman, New York, N. Y.

1,103,359. Method of making sponge rubber. J. Huebner, Chicago, Ill.

1,103,443. Drying machine. O. S. Sleeper, assignor to Buffalo Foundry & Machine Co.—both of Buffalo, N. Y.

1,103,464. Instep support. J. W. Arrowsmith, Morristown, N. J.

1,103,465. Bunion shield and corrector. J. W. Arrowsmith, Morristown, N. J.

1,103,478. Vehicle tire. O. W. Britt, San Francisco, Cal.

1,103,637. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York, N. Y., one-fifth to the Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York, N. Y.

1,103,642. Wheel tire. A. M. Zimmers, Baltimore, Md.

1,103,670. Air cushion for rubber stamps. C. C. Gibson, Buffalo, N. Y.

1,103,684. Atomizer. E. R. Pettit, Philadelphia, Pa.

1,103,813. Vehicle wheel. T. B. Murray, Scotstoun, Scotland.

1,103,848. Blow-out patch. C. L. Smith, Brooklet, Ga.

1,103,874. Ventilating and disinfecting means for shoes. H. W. Halley, Hutchinson, Kan.

1,103,877. Pneumatic tire. H. F. Heycock, Dunedin, New Zealand.

1,103,892. Rubber sole for boots and shoes. C. S. Redfield, Brookline, Mass., assignor to Essex Rubber Co., Inc., Trenton, N. J.

1,103,914. Cushion heel shoe. C. C. Eaton., assignor to C. A. Eaton Co.—both of Brockton, Mass.

Trade Marks.

67,457. Franklin Caro Co., Richmond, Va. The word *Caro*. For chewing gum.

76,250. Montgomery Ward & Co., Inc., New York and Brooklyn, N. Y.; Chicago, Ill.; Fort Worth, Tex.; Kansas City, Mo., and Portland, Ore. Diamond shaped design formed of two triangles enclosing the letters *M W*. For rubber belting, leather belting, etc.

76,815. J. P. Gallagher, Philadelphia, Pa. The word *Galwin*. For rubber compound, etc.

77,115. The Bee Bee Confection Co., Dayton, Ohio. An illustration of a fan between the words *Fan* and *Tan*. For chewing gum.

77,949. Converse Rubber Shoe Co., Malden, Mass. The word *Tuff-E-Nuff*. For rubber tires, casings and inner tubes.

79,153. Imperial Rubber Co., New York, N. Y. The word *Innovation*. For electrical apparatus, machines and supplies.

ISSUED JULY 21, 1914.

1,103,960. Artificial limb. J. E. Hanger, Jr., St. Louis, Mo.

1,103,967. Drainage tube. H. E. Hughes, Baltimore, Md.

1,104,074. Air valve for pneumatic tires. F. P. Root, Akron, Ohio.

1,104,078. Twisting machine. W. F. Smith, Chicago, Ill., assignor to Western Electric Co., New York, N. Y.

1,104,108. Garment stay. J. R. Dean, North Girard, Pa.

1,104,179. Photographic ray-filter, with soft rubber lining ring. W. F. Folmer, assignor to Eastman Kodak Co.—both of Rochester, N. Y.

1,104,186. Pneumatic tire. H. B. Gillette, Grand Rapids, Mich.

1,104,252. Vacuum cup releasing device for lamps. W. P. Dunham, Los Angeles, Cal.

1,104,267. Skirt with elastic strips in waist band. M. Mayers, New York, N. Y.

1,104,296. Stock shell for winding fabrics. W. F. Gammeter, Cadiz, Ohio.

1,104,343. Cushion shackle for running gear of vehicles, comprising a plurality of rubber pads. A. Buonicore, New York, N. Y.

1,104,382. Life preserver. J. M. Pineau, Quincy, Mass.

1,104,426. Tire. F. Keller and H. Cogan, Paterson, N. J.

1,104,441. Surf coaster. A. N. Nelsen, Longbeach, Cal., assignor of one-half to H. J. Woods, Hollywood, Cal.

1,104,508. Hose construction. C. K. Huthsing, St. Louis, Mo.

1,104,514. Eraser for lead pencils. A. Kilstrom, Providence, R. I.

1,104,566. Fountain pen. R. W. Springer, Springfield, Ill.

1,104,567. Fountain pen. R. W. Springer, Springfield, Ill.

1,104,607. Perfume atomizer. F. Berger, Baltimore, Md.

1,104,625. Skirt with elastic gore. E. Caplan, Philadelphia, Pa.

1,104,659. Syringe Nozzle. F. A. Gordon, Spokane, Wash.

1,104,664. Supporting belt. E. Guggenheim, assignor to M. W. Schloss Manufacturing Co.—both of New York, N. Y.

1,104,674. Belt for catamenial sacks. C. Johnson, Seattle, Wash.

1,104,722. Vulcanizer. O. Walter, Hanover, Germany.

1,104,744. Process of treating Pontianak. A. R. Ellison, Brookline, Mass.

Trade Marks.

78,123. A. R. Garrod, New York, N. Y. The word *Pediforme*. For shoes of rubber, leather, etc.

78,213. Wright & Ditson, Jersey City, N. J. The word *Ringer*. For golf balls.

78,519. The B. F. Goodrich Co., New York, N. Y. The word *Imit*. For rubber hot water bottles and fountain syringe bags.

78,696. Ferguson Waterproof Co., St. Louis, Mo. The words *Water King*. For waterproof coats, jackets, ponchos, etc.

78,919. L. Candee & Co., New Haven, Conn. A narrow embossed band on the upper margin of a boot or shoe. For rubber boots and shoes.

78,963. W. A. Rockrohr, Chicago, Ill. The words *Tite Wad*. For rubber putty.

78,974. Wm. Wrigley Jr. Co., Chicago, Ill. The word *Fatima*. For chewing gum.

78,975. Wm. Wrigley Jr. Co., Chicago, Ill. The word *Recruit*. For chewing gum.

78,976. Wm. Wrigley Jr. Co., Chicago, Ill. The words *Good Luck*. For chewing gum.

78,977. Wm. Wrigley Jr. Co., Chicago, Ill. The word *Picnic*. For chewing gum.

78,978. Wm. Wrigley Jr. Co., Chicago, Ill. The word *Pick*. For chewing gum.

78,979. Wm. Wrigley Jr. Co., Chicago, Ill. The words *Pay Car*. For chewing gum.

78,981. Wm. Wrigley Jr. Co., Chicago, Ill. The word *Favorite*. For chewing gum.

78,982. Wm. Wrigley Jr. Co., Chicago, Ill. The word *Polo*. For chewing gum.

78,983. Wm. Wrigley Jr. Co., Chicago, Ill. The words *Old Mill*. For chewing gum.

78,985. Wm. Wrigley Jr. Co., Chicago, Ill. The words *Home Run*. For chewing gum.

78,986. Wm. Wrigley Jr. Co., Chicago, Ill. The words *Horse Shoe*. For chewing gum.

78,987. Wm. Wrigley Jr. Co., Chicago, Ill. The word *Piedmont*. For chewing gum.

78,989. Wm. Wrigley Jr. Co., Chicago, Ill. The words *King Bee*. For chewing gum.

79,183. J. Schmid, Inc., Astoria, N. Y. The word *Malbo*. For rubber ice bags.

ISSUED JULY 28, 1914.

1,104,774. Tire for vehicles. R. B. Calcutt, Chicago, Ill.

1,104,777. Braided fabric for hose. H. Z. Cobb, Winchester, Mass., assignor to Revere Rubber Co., Providence, R. I.

1,104,778. Braided fabric for hose. H. Z. Cobb, Winchester, Mass., assignor to Revere Rubber Co., Providence, R. I.

1,104,783. Tire. W. Drabold and A. P. Mott, Detroit, Mich.

1,104,789. Machine for inclosing cords in tire wrappers. E. W. Fothergill, assignor to Hartford Rubber Works Co.—both of Hartford, Conn.

1,104,797. Elastic tire for vehicles. H. Hartmann, Etterbeek, near Brussels, Belgium

1,104,817. Resilient tire for automobile and other vehicle wheels. J. J. A. Miller, Denver, Colo.

1,104,824. Pneumatic tire. C. M. Papon, Philadelphia, Pa., assignor of one-half to E. Bleyer, Laverock, Pa.

1,104,874. Detachable wheel rim. C. E. Cameron, Collingswood, N. J., assignor to W. A. Mooney, H. J. Looby, J. B. Connolly and C. E. Cameron, Philadelphia, Pa.—a copartnership trading as Lightning Demountable Rim Co.

1,104,876. Housing. E. Clark, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.

1,104,886. Tire filler. W. E. Graves, Topeka, Kans.

1,104,899. Vehicle wheel. T. F. E. Hutchings, New York, N. Y.

1,104,902. Automatic relief valve for tires. V. O. Jarvis, Hanford, Cal.

1,104,955. Hose coupling. W. J. Bellows, Walla Walla, Wash.

1,104,984. Safety pocket clasp with elastic strips. C. Gleckler, Staunton, Ill.

1,105,121. Convertible tire R. Wright, Cleveland, Ohio.

1,105,127. Smoke mask for respiration apparatus. A. B. Dräger, assignor to Drägerwerk Heinr. und Bernh. Dräger—both of Lubeck, Germany.

1,105,211. Vehicle wheel. O. Schaller, Webster Groves, Mo.

1,105,270. Rubber footwear. L. J. Grosky, Cleveland, Ohio.

1,105,342. Vehicle tire. C. A. Swinehart, Akron, Ohio.

1,105,355. Combined suspender tab and belt loop for trousers. A. Leighton, Erie, Pa.

1,105,365. Attachment for arm baths. A. M. McQuhae, Toronto, Ont., Canada.

1,105,368. Elastic bedding plate. E. Müller, Berlin, and A. Kayser, Wilmersdorf, near Berlin, Germany, assignors to Dübelwerke Gesellschaft mit beschränkter, Haftunf, Berlin, Germany.

1,105,437. Overshoe. E. A. Hunter, Des Moines, Iowa.

1,105,459. Tire for vehicle wheels. F. Rose, Liverpool, and Andrew Rae, Seacombe, England.

1,105,476. Artificial tooth. R. M. Withycombe, Sydney, New South Wales, Australia.

1,105,488. Urinal. C. E. Clare, Chicago, Ill., assignor to Sharp & Smith, Chicago, Ill.

1,105,568. Composition of matter, consisting of guayule, balata, etc. E. D. Kendall, Elizabeth, N. J., assignor of one-third to D. Q. Brown, New York, N. Y., and one-third to A. R. Ledoux, Cornwall, N. Y.

1,105,569. Pneumatic suit for aviators. N. Lacrotte, Paris, France.

Trade Mark.

79,032. C. Gotzian & Co., St. Paul, Minn. The words *Lady Comfort*. For ladies', misses' and children's shoes made of rubber or leather.

[NOTE.—Printed copies of specifications of United States patents may be obtained from THE INDIA RUBBER WORLD office at 10 cents each, postpaid.]

GREAT BRITAIN AND IRELAND.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1913.

**Denotes Patents for American Inventions.*

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 1, 1914.]

5,799 (1913). Elastic fabric. E. Baumgarten, 114, Klingelhollstrasse, Barmen, Germany.

5,825 (1913). India rubber substitute. G. Frétard, 49, Rue des Martyrs, Paris, France.

5,826 (1913). Wheel tire. G. Frétard, 49, Rue des Martyrs, Paris, France.

5,886 (1913). Spring wheel. C. E. Dowling, Wimmera street, Dimboola, Victoria, Australia.

5,992 (1913). Hand bag with rubber attachments which can be converted into a life belt. R. Dann, 15 Rowley Grove, Stafford.

6,016 (1913). Golf ball. P. A. Martin, Granville street, and J. Stanley, 137 Ivor Road, Sparkhill—both in Birmingham.

6,019 (1913). Inflatable waterproof life saving garment. W. MacDonald, Queensborough, British Columbia, Canada.

*6,024 (1913). Tires, elastic: special apparatus for making. E. Oliver, Daytona, Florida, U. S. A.

6,035 (1913). Oils, fats, balsams, adhesives, resins, caoutchouc, gutta percha and other cellulose derivatives. L. Lilienfeld, 1, Zeltgasse, Vienna, Austria.

6,041 (1913). A device for closing the bung-holes of casks, carrying a rubber disc. L. Pearson, "Angel Hotel," Brook street, Chester.

6,051 (1913). Tire attachment to rims. L. Pelloux, 2, Rue Marceau, Levallois-Perret, Seine, France.

6,183 (1913). Egg testing device comprising a tube composed of rubber. S. H. French, 112 Fernside Road, Balham, London.

6,246 (1913). Spring wheel. V. Köchel, Breitenbach, near Brückenan, Germany.

6,280 (1913). Rubber stopper for aerated liquids vessel. P. C. Carriere, Wizernes, Pas de Calais, France.

6,360 (1913). Hand stamp. R. Villon, 3, Rue des Lions, Paris, France.

6,378 (1913). Cutting india rubber, etc. C. Anthony, Gould Road, Twickenham, Middlesex.

6,387 (1913). Plastic compositions suitable for the manufacture of substitutes for ebonite, etc. L. Lilienfeld, 1, Zeltgasse, Vienna, Austria.

6,394 (1913). A wooden sole formed of a fore-part and a heel part connected by a strip of leather, rubber, or the like. A. Augestad, Larvik, Norway.

6,403 (1913). Molding fibrous materials by hydraulic pressure upon a rubber diaphragm. E. Lanhoffer, 2, Boulevard de Maisons, Poissy, Seine et Oise, France.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 8, 1914.]

6,404 (1913). Molding fibrous materials by means of a pressing die, which bears upon the material through an elastic cushion of liquid contained in a closed space bounded by a rubber diaphragm. E. Lanhoffer, 2, Boulevard de Maisons, Poissy, Seine et Oise, France.

*6,472 (1913). Cushion or pad of cloth-faced rubber. J. B. Henry, Bozeman, Montana, U. S. A.

6,514 (1913). Fishing-rod ring provided with a rubber ring between the center and the metal frame. P. F. Wadham, "Waltondale," Newport, Isle of Wight.

6,580 (1913). Wheel tire, jacket and cover; tread projection. T. D. Kelly, 9, Avenue Road, Southend, Essex.

6,667 (1913). Tire—non-elastic—and rim. G. E. Greaves, Woronzoff street, Berdiansk, South Russia.

6,718 (1913). Driving belt manufacture. Rudge-Whitworth, Ltd., Rudge Works, J. V. Pugh, Guiting House, Allesley, and W. Blair, 65 Earlsdon street—all in Coventry.

6,810 (1913). Machine for studding tire treads. Dunlop Rubber Co. and D. G. Snodgrass, Manor Mills, Salford street, Aston, Birmingham, and W. A. Turpin, Warple Way, Acton Vale, London.

6,828 (1913). Rubber rollers to facilitate the opening and closing of bureau drawers. P. Barker, 21 Reuben street, South Circular Road, Dublin, Ireland.

6,863. (1913). Tapping rubber trees. A. J. M. Ledeboer, Kalisat, Java, Dutch Indies.

6,898 (1913). Spring wheel with continuous outer rigid ring and rubber ring. A. M. Laurence, 269 High street, Exeter.

6,920 (1913). Spring wheel with spring between hub and flexible or non-rigid rim. M. Gilles, 11, Zülpicherplatz, Cologne, Germany.

6,925 (1913). India rubber adhesive. F. E. Anglada, 10, Vergara, Barcelona, Spain.

6,985 (1913). Fluid transmitting tubular hose. W. C. Gardiner, of Reddaway & Co., Cheltenham street, Pendleton, Manchester.

6,986 (1913). Tubular fabric. W. C. Gardiner, of Reddaway & Co., Cheltenham street, Pendleton, Manchester.

7,027 (1913). Disc wheel. E. F. Goodyear, Reliance Works, Dudley, Worcestershire.

7,047 (1913). Disc wheel; detachable rim attachment to wheel. F. W. Brampton, Cookley Iron Works, Kidderminster, Worcestershire.

7,071 (1913). Pneumatic wearing apparel for aviators. N. Lacrotte, 136, Avenue Parmentier, Paris, France.

*7,083 (1913). Spring wheel. B. Anderson and J. E. Green, Rock Springs, Wyo., U. S. A.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 15, 1914.]

7,179 (1913). Feeding bottle teat. C. J. Mansfield, Jr., United Service Club, Charles street, London.

7,195 (1913). Tire inflating pump. O. A. Bennewitz, Eutin, Oldenburg, Germany.

*7,212 (1913). Wheel tire. J. Anthony, Attleboro, Mass., U. S. A.

7,227 (1913). India rubber shock absorbing covering for stylus bar of phonograph. E. Huch, 70, Bismarckstrasse, Steglitz, near Berlin, Germany.

7,279 (1913). Belt for motorcycles, etc., comprising continuous plies of leather, rubber, etc. E. Lycett, Bromley street, Birmingham.

7,314 (1913). Trouser creasing by application of gutta percha sheet C. Heymann, 39, Rue de Paradis, Paris, France.

7,363 (1913). Tools for removing and replacing tires. J. Hornby, 40, Hope street, Southport, Lancashire.

*7,382 (1913). Electric conductor comprising rubber cushioning. F. Browalski, Box No. 226, Worden, Ill., U. S. A.

7,452 (1913). Apparatus for detecting and closing punctures. E. Siegenthaler, 107, Moore Park Road, Fulham, London.

7,490 (1913). Rubber cushion rail for billiard table. F. A. Alcock, 155, Elizabeth street, Melbourne, Australia.

7,512 (1913). Air compressor for inflating motor vehicle tires. J. J. H. Sturmey, The Quarry Close, St. Nicholas street, Coventry.

7,560 (1913). Rubber sponge. H. A. Wanklyn, 17, Manchester avenue, London.

7,566 (1913). Horseshoe with rubber cushion. W. Basjanoff, Sredni Tischinsky, Pereulok, Grusini, Moskow, Russia.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 22, 1914.]

7,628 (1913). Weavers' shuttle threader with rubber lined nozzle. B. Taylor, 10, Brentwood avenue, Timperley, Cheshire, and T. Earnshaw, 21, Lawrence Road, Broadheath, Altrincham.

7,759 (1913). Spring wheel with rubber tread blocks. A. D. Curling, St. Dunstan's, Canterbury, Kent.

7,761 (1913). Tread band for pneumatic tire. W. J. Jackson, Mellersh, 28, Southampton Buildings, London.

7,762 (1913). Sleeping bag, knapsack, stretcher. R. Skancke, Bjorn Farmands, Gate 11, Christiania, and J. F. Aasnaes, Selvig in Sande, Norway.

7,817 (1913). Inflating tire while in motion. A. Grimmer, 70, George street, and B. Drummee, 66, George street, both in Great Yarmouth.

7,827 (1913). Necktie retainer. F. Drinkewitz, Rathenow, Germany.

7,945 (1913). Synthetic caoutchouc substances. Farbenfabriken vorm. F. Bayer & Co., Leverkusen, near Cologne, Germany.

7,968 (1913). Drawing or sketching appliance containing rubber. A. Cuvelier, 37, Rue de l'Université, Paris, France.

7,969 (1913). Hand bag with rubber draw cord. Millington & Sons and F. E. Willcocks, Budge Row, London.

8,040 (1913). Purifying rubber and other colloidal solutions. H. Debauge, 32, Avenue Montaigne, Paris, France.

*8,060 (1913). Spring wheel. J. T. Clark, 142 West Second street, Provo, Utah, U. S. A.

8,061 (1913). Tire wrapping machine. T. E. Robertson, 104 Victoria street, Westminster.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 29, 1914.]

*8,071 (1913). Elastic band for attaching ruffles to undergarments. C. F. Schultz, 124 Maple street, Reading, Pa., U. S. A.

8,119 (1913). Solid tire and tire cover comprising rubber or the like. A. E. Wale, Coleshill, near Birmingham, and Wale's Invulnerable Tire Syndicate, Broad Street House, London.

8,159 (1913). Rubber heel protector. P. Stern, 2, Forray-Gasse, Arad, Hungary.

8,160 (1913). Inkstand with rubber air container. H. G. Neumann, Dringenburg, Post Hahn, Oldenburg, Germany.

8,219 (1913). Apparatus in which glass plates, etc., are lifted by a series of vacuum cups formed with single or concentric rubber rings. Soc. Anon. des Manufactures des Glaces et Produits Chimiques de St. Gobain, Chauny et Cirey, Franière, Belgium.

8,323 (1913). Flesh rubbers for lathering appliances. W. Lloyd and W. Loder—both of 26, King street, Brighton.

8,380 (1913). Non-skid device for motor vehicles, comprising a gripping wheel surrounded by hard rubber. E. J. Buckingham, 5, Oval House, Brixton Oval, London.

8,485 (1913). Magnetic separators. S. J. H. Nathorst, Gellivare, Malmfalt, Malmberget, Sweden.

*8,506 (1913). Spring wheel with continuous outer rigid ring and pneumatic rubber ring and like cushions. A. J. Meyer, 2718 North Whipple street, Chicago, Ill., U. S. A.

*8,640 (1913). Spring wheel carrying a solid rubber tire. A. A. Picard, 162 West Fifty-sixth street, New York, N. Y., U. S. A.

8,648 (1913). Knitted garment having an elastic band. W. Buckler and O. Kerr, Walnut street, Leicester.

8,659 (1913). Spring wheel with pneumatic cushion. M. D. MacGoun, Carterton, New Zealand.

NEW ZEALAND.

[ABSTRACTED IN THE PATENT OFFICE JOURNAL, JUNE 4, 1914.]

34,379. Cushion for the heels of footwear. H. Goodacre, Courtney street, Plymouth.

34,535. Machine for testing billiard tables, comprising rubber pads or buffers. J. D. Cade, Park Road, Addington, Christchurch.

[ABSTRACTED IN THE PATENT OFFICE JOURNAL, JUNE 18, 1914.]

*34,625. Making and molding device for rubber articles. F. T. Roberts and R. H. Roshenfeld—both of Trenton, N. J., U. S. A.

[ABSTRACTED IN THE PATENT OFFICE JOURNAL, JULY 2, 1914.]

34,679. Elastic pencil carrying device. K. M. Stevens, Maungatapere, Whangarei.

THE FRENCH REPUBLIC.

PATENTS ISSUED (with Dates of Application).

466,529 (December 24, 1913). Elastic tire for vehicles. Century Rubber Co.

466,764 (December 30). Appliance for retaining rubbers in place on shoes. E. J. Akins.

466,797 (October 11). Improvements in hosiery looms using rubber wefts, in plain and ribbed effects. P. M. Kretz.

466,923 (December 30). Improvements in rims and tires for all kinds of vehicles. F. J. Hadfield.

466,957 (January 3, 1914). Process for making tire covers. H. J. Doughty.

466,967 (January 3). Pneumatic tire divided into segments. E. R. Devereux.

467,009 (January 5). Improvements in vehicle tires. M. D. Rucker.

467,014 (January 5). Dress shield with movable sheet of rubber. Madame de Clion.

467,124 (January 6). Improvements in rotating heels for footwear. E. V. Argand.

467,242 (January 13). Elastic wheel for vehicles and other purposes. J. Duchateau.

467,302 (March 26, 1913). Pneumatic tire with rigid cover for vehicle wheels. A. Blum.

467,366 (January 16, 1914). Cover for wheels of automobiles and other vehicles. A. Mazio.

467,455 (January 19). Protective appliance for air chambers of pneumatic tires. C. Sigg.

467,477 (January 20). Improvements in so-called rotating heels. Madame Debruge-Lebaillif.

467,489 (January 20). Improvements in mudguards for vehicle wheels. L. A. Garchez.

467,546 (January 21). Elastic tire for vehicles of all kinds. A. Boerner.

467,552 (January 21). System of mudguard. L. A. Gouot.

467,577 (January 22). Armed pneumatic tire. J. E. Lee.

467,646 (April 2, 1913). Cover removable from a filled tire. F. Pfleumer.

467,653 (January 23, 1914). Elastic wheel. A. Ballare.

467,713 (January 26). Tire for wheels. F. Lüdecke.

467,738 (January 26). Elastic wheel for automobiles and other vehicles. M. Bovy.

467,868 (January 30). Wheel with demountable rim. Prowodnik Co.

468,011 (February 3). Elastic tire. M. Clark.

468,112 (February 6). Protective appliance for pneumatic tires. F. C. Bigé.

468,158 (February 7). Process and appliance for making plain and fancy rubber cord on a lacing loom. Gustav Funkenberg Co.

468,160 (February 7). Improvements in rubber mudguards covered with fabric for automobiles and other vehicles. "Parisienne" Rubber Co.

468,169 (February 7). Mudguard for vehicles. E. Loscher.

THE GERMAN EMPIRE.

PATENTS ISSUED (with Dates of Validity).

276,363, Class 39b (June 25, 1913). Process for production of solid elastic masses. Dr. Walter Meusel, Treptower Chaussée, Berlin.

276,678, Class 39b (August 6, 1913). Separation of rubber from its similar sub-products in the synthesis of rubber. Arthur Heinemann, London.

276,775, Class 39b (April 16, 1913). Manufacture of products resembling vulcanized rubber. Badische Anilin- & Soda-Fabrik, Ludwigshafen-on-Rhine.

276,700, Class 63e (July 2, 1913). Wheel tires of rubber with hollow spaces transversely arranged. Albert Wetzel, Ludwigsburg.

276,960, Class 39b (April 16, 1913). Manufacture of products resembling vulcanized rubber. Badische Anilin- & Soda-Fabrik, Ludwigshafen-on-Rhine.

277,340, Class 30k (October 11, 1913). Inhaling apparatus. Carl August Ulbrich, Rüschlikon, Switzerland.

277,451, Class 63e (December 20, 1913). Protective cover for pneumatic tires. Hercules Pneumatic Tire Works, Bremen.

277,505, Class 39b (July 27, 1913). Separation of vulcanized rubber from fabric and metallic linings. Jules Frydmane, Paris.

277,549, Class 39b (April 19, 1913). Process for making rubber compounds with or without the use of filling substances. Condensite Company of America, Glen Ridge, N. J., U. S. A.

277,630, Class 86c (November 15, 1912). Elastic tissue, some parts of which are non-elastic or less elastic than the remainder. Julius Römpler Co., Zeulenroda.

RUBBER TREAD WITH STEEL STUDS.

It is well known that steel-studded tires often slip on asphalt, street car tracks and stone pavements but grip the road surface on macadam. A combination of rubber and steel, however, prevents side slips on all kinds of roads. A new tire, which it is claimed embodies this principle has recently been placed upon the English market. As shown in the illustration, the tread of the tire is grooved and these grooves are provided with steel studs set into the rubber, their top surfaces being flush with the tread. This allows greater resilience than is often realized in the separate studded tire cover. Also, a tire of this kind does not require such high inflation as does one with an additional protector and it is therefore more comfortable to ride upon. [The Sirdar Rubber Co., 21 Crawford street, London, England.]

THE MARKET FOR COMPOUNDING INGREDIENTS AND CHEMICALS.

THE general chemical market has been affected by the recent dislocation more than the actual rubber market, and perhaps more than any other large line of business.

Fortunately towards the end of the month the hysteria has quieted down, and it is seen that we may produce many things we have been importing or use substitutes to a great extent. Prices are thus tending to a steadier basis.

SULPHUR.

This most important substance for the rubber man we described in our August issue at some length, showing that in the last ten years America had succeeded in producing enough for her entire supply instead of being dependent on Italy or Sicily as heretofore. It is understood that there is in stock enough to last the entire United States for about three years. The prices, therefore, will not rise. But other industries, such as the paper industry and the acid industry, which have used Spanish pyrites, may be forced to use home-produced sulphur, when the consumption will greatly increase.

Brimstone is quoted at $22.50 per long ton, while roll sulphur is quoted at $1.85 per hundred pounds, with flour and flowers at $2 to $2.40.

ZINC OXIDE AND LITHOPONE.

While the United States makes a large quantity of these articles, yet much has been imported. Liege is about the center of the Belgian zinc industry, which extends down into Luxemburg, so that imports will not amount to much in the near future. The United States exported 3,100,835 pounds in June, worth $130,459.

Present quotations for zinc oxide are: 5½c. for American process, 6.5c. for French process red seal, 7c. for green seal, and 7.5c. for white seal. No quotations are available on French and German zincs.

There is no settled quotation on the market for foreign grades of lithopone. Inquiry has been increased for domestic by the present state of the foreign market. It has been stated that there is considerable difference in quality between the products of different domestic makers, and buyers are careful about the quality. Prices are quoted at 3.75 to 4.25c. per pound.

LEAD COMPOUNDS.

Fortunately the United States produces much more lead and its compounds than it consumes, and importations are confined to special grades, believed by some to be better than the domestic products.

Litharge is quoted in a large way at 5.25c. per pound, and smaller quantities are somewhat higher. Red lead is quoted at 5.75 to 6.5c. per pound, and orange mineral is quoted at 8.5c. per pound, while the Old Dutch process white lead sells at 5.25c. per pound and the sublimed lead (basic sulphate) at the same figure.

EARTHY FILLERS.

Magnesia.—Most of the magnesia used in the United States has been imported from the neighborhood of the Balkans, and while calcined magnesite, with 90 per cent. of pure magnesia content, has been sold at $30 per ton, the higher grades have sold as high as 10c. per pound. With the foreign supply shut off prices will be subject to violent fluctuations. There are immense deposits on the Pacific Coast which will be available with the opening of the canal, and American manufacturers are rushing up works to produce this article.

Chalk.—This is a product we have been importing, and, with the shutting off of supplies, prices will be erratic until importations from England, which are promised, again begin. There is no American chalk which can compete with the English.

China Clay.—It is reported that boats are loading for shipment from England. In the meantime the American product can be had at $9 per ton.

Barytes.—Imported grades are nominal. The United States has immense deposits in Missouri and elsewhere, and it is only a matter of freight to get them to market. Good grades of domestic are quoted at $17 to $20 for floated f. o. b. works.

Whiting.—The uncertain position of chalk makes an uncertain market for this product, but manufacturers are said to be stocked with a supply for the next six months. Blanc fixe is quoted at 4c. per pound in 600-pound barrels.

SOLVENTS.

Sulphur Chloride.—While this is not in the usual sense a rubber solvent, yet it is a liquid used with other solvents. As it is a kind of by-product and made in the United States, its price may continue stable.

Naphthas.—The rubber trade has seen the price of petroleum naphthas steadily rise for a long time and the quality gradually grow worse. This was due to the enormous demand for motor gasoline, which has increased so astonishingly. Several months ago, however, there began a recession of prices on all light petroleum products owing to the discovery of enormous quantities of oil in the Cushing pool in Oklahoma, which in some cases gave 35 per cent. gasoline. The present disturbance has prevented exportation, and therefore will tend to depress prices still further. At present automobile gasolene is sold on a basis of 13c. in New York, and other light products in proportion.

Now is the time for the rubber industry to insist on again getting a suitable naphtha, such as was furnished, say ten years ago, and which can now be made in almost unlimited quantities.

Benzol and coal-tar naphthas are advancing in price, owing to their use in making the aniline dyes formerly imported.

Carbon bi-sulphide is excited and has risen to 15c., though almost the entire consumption is produced in domestic plants. Carbon tetra-chloride has jumped from 6.5c. to 10c. in car lots, and any price may be asked or given—18c. has been quoted.

Lamp-black.—The foreign grades are of course out of sight and will soon be out of mind. Domestic gas carbon black may be had at 3c. to 6c. per pound.

Waxes.—Beeswax is quoted at 40c., and as we import a considerable quantity it may advance. White ozocerite is quoted at 25c. and is an article imported from Austria. Paraffine wax, on the other hand, is a domestic article, and the best grade of 135 m. p. is quoted at 6.5c. per pound.

Of course these prices are only for the minute and may vary widely from day to day till a final readjustment is accomplished.

SITUATION OF PLANTATION COMPANIES.

Advances on shipping documents are the pivot on which the trade of the Far East turns. Hence the refusal of the banks to make the usual advances has been severely felt by the plantation companies. The necessity of some action has been urged if the labor force on the estates is to be kept in shape.

Suggestions have been made of the banks making advances within definite limits; guaranteed in each case by the colonial government affected. A scheme of this character should, it has been added, include Sumatra and Java, as well as the Federated Malay States, Straits Settlements, South India, Borneo and Ceylon.

The European staffs of various plantation companies have been requested for the present to confine their salary drawings to urgent requirements.

The Kepong (Malay) Rubber Estates, Limited, has cancelled the resolutions for the payment of an *interim* dividend on July 15. It has been decided to follow this course as a precautionary measure, with a view to increasing the cash resources of the company. Similar action has been taken by the Anglo-Malay Rubber Co., Ltd.

Review of the Crude Rubber Market.

SINCE April 17, when the London prices of fine Para and plantation rubber stood on a level at 3*s.* ½*d.* (73.99 cents) the former had by July 31 receded to 2*s.* 10½*d.* (69.93), while the latter had dropped to 2*s.* (48.65 cents). The latter days of July had witnessed a fair demand for consumption. Confidence was felt in the situation of the American trade; the demands reported for fall tending to disprove any idea of United States manufacturers being overstocked with goods. Meanwhile, rubber supplies of unprecedented magnitude were anticipated from the East.

The month of July with three auctions including an aggregate of 2,535 tons was a test of the market's absorbent capacity. Two sales were held at the normal dates of July 7 and 21, each of about 1,000 tons, which met with a brisk demand. Owing to the approach of the Bank Holiday on August 3, a supplementary auction was held on July 28, the last sale held before the market closed by reason of the war. About 440 tons were offered, for which competition was good, prices showing a reduction of only ¼*d.* to ½*d.* on those ruling the previous week.

The latest nominal quotations on August 1, before the holidays, were fine Para 2*s.* 10*d.* (68.92 cents); plantation 2*s.* (48.65 cents).

In view of the opening of the war in the first days of August business was dislocated and although on August 8 the price of 2*s.* (48.65 cents) was nominally still current for plantation, no business was being done, the disturbance of shipping facilities rendering both sellers and buyers disinclined to operate.

The market had not reopened after the bank holiday of August 3, and the auction scheduled for August 11 was indefinitely postponed.

NEW YORK MARKET FOR PARA RUBBER.

In the closing days of July upriver fine Pará was being offered in New York at 72 cents and first latex at 55-56 cents; quotations on July 30 being respectively 70-71 cents and 54-55 cents. On July 31 contract business was suspended and all quotations by speculators withdrawn. August 1 witnessed a market of the usual quietness for a Saturday. On the following Monday, August 3, while London was closed, there was a sharp advance in upriver fine Pará, a sale having been reported at $1 a pound, being 30 cents above the price of 70 cents current on the previous Saturday.

From August 5 to August 15 prices nominally ranged from $1.10 to $1.25; sales being reported at $1.10 to $1.20.

On August 12, advices were received of a steamer with 275 tons of rubber being scheduled from Brazil, but leading sellers would not quote less than $1.10; nominal quotation of August 13 was $1.15 to $1.25, with a good inquiry from manufacturers, but with actual business light. On August 14 business was transacted at $1.10, like conditions being reported on August 15.

The break in prices which occurred on August 17, owing to large arrivals and anticipated large shipments, rendered the market very sensitive. Upriver fine could be purchased at 90 cents, as compared with $1.10 on the previous Saturday. In the opinion of prominent manufacturers the prospects of the needed supply of rubber were more promising than had been the case.

The quotations on August 24 and 25 were 80 to 90 cents and on August 27, 75 to 80 cents. The latest cable from London (August 26) quoted Upriver Pará at 2*s.* 11*d.* (70.95 cents) as compared with 2*s.* 10*d.* (68.92 cents) on August 1.

The New York market has been relatively bare of advices from Brazil, the government of that country having declared a holiday until August 15. It was however anticipated by importers that Brazilian supplies would come forward according to schedule. The view was entertained in some quarters that as the production of the Amazon had been dropping off from year to year, it would not entirely cover the wants of American manufacturers, even if they got the whole of it. It was anticipated that supplies from the Far East and Brazil would come forward in the near future, but the rates of insurance and exchange rendered operations difficult.

According to a report current, a London syndicate is said to have purchased the largest proportion of the London supply with the intention of shipping it to America.

It was moreover reported that the Finance Minister of Brazil contemplates dispatching to the United States several vessels carrying rubber from Pará, to bring back food and other products.

NEW YORK MARKET FOR PLANTATION RUBBER.

Plantation rubber had closed on July 30 at 54 to 55 cents, but was affected in sympathy with the movement in fine Pará, and on August 5 was nominally $1.08, while for actual business it was reported that 85 to 90 cents would be accepted. On August 8, sales were made at $1.10 to $1.15, while on August 10, $1.12 was paid. This price was approximately maintained on the following days. On August 17 the market dropped to 90 cents under the influence of actual and prospective receipts, in conjunction with the market situation.

On August 18, in London, first latex pale crêpe was quoted at about 79 cents c.i.f. New York (while in New York 80 to 85 cents remained the nominal quotation).

During the last few days the course of plantation prices in New York has been: August 19, 80 to 85 cents; 20th, 80 to 85 cents; 21st, 80 to 85 cents; 22d, 80 to 85 cents; 24th, 75 cents; 25th, 75 cents; 26th, 70 to 75 cents.

An auction of 400 tons plantation took place in London on 25th, when quotations were nominal.

By the latest London cable (August 26) the quotation for first latex pale crêpe was 2*s.* 1¼*d.* (51.18 cents), as compared with 2*s.* (48.65 cents) on August 1.

The Antwerp sale of July 23 resulted as follows:

	Offered	Sold	Percentage of reduction on valuations
Congo .....*tons*	274	162	4½
Plantation	235	223	3

Consumers had of late been taking up rubber on its arrival, so that stocks were normal. Another auction had been announced for August 19, which has been postponed *sine die*, in view of the grave situation in Belgium. The quantities scheduled were 126 tons Congo and 56 tons plantation.

At the Amsterdam inscription sale of July 28, 157 tons *Hevea* and 12 tons *Ficus* were sold at low prices; the *Hevea* realizing 4 per cent. and the *Ficus* 10 per cent. below valuations. Of the total of 169 tons, 164 were sold. The date of the next Amsterdam sale has not yet been fixed.

In the Rotterdam sale of July 31 were included about 32½ tons *Hevea* and 7 tons *Ficus*. Owing to the present disturbed situation a date has not yet been fixed for the next sale.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and August 29, the current date:

PARA.	Sept. 1, '13.	Aug. 1, '14.	Aug. 29, '14.
Islands, fine, new.....	77@78	57@59	65@70
Islands, fine, old.....	.....	58@62	.....
Upriver, fine, new.....	88@89	72@73½	75@80
Upriver, fine, old.....	92@	72@75	.....
Islands, coarse, new.....	29@30	27@29	45@

PARA.	Sept. 1, '13.	Aug. 1, '14.	Aug. 29, '14.
Islands, coarse, old	.....	.....	.....
Upriver, coarse, new	51@52	39½@42	55@60
Upriver, coarse, old	.....	.....	.....
Cameta	37@38	30½@31½	40@
Caucho, upper	50@51	38@41	50@
Caucho, lower	.....	35@37	.....
PLANTATION CEYLON.			
Fine smoked sheet	70@72	56@59	75@80
Fine pale crepe. near-by / forward	67@68	53@56 / 52@53	70@75
Fine sheets and biscuits unsmoked	65@66	54@56	70@75
CENTRALS.			
Corinto	.....	39@42	50@
Esmeralda, sausage	50@51	38@41	45@
Guayaquil, strip	.....	.....	.....
Nicaragua, scrap	50@51	35@40	40@
Panama	.....	.....	.....
Mexican plantation, sheet	.....	40@47	.....
Mexican, scrap	48@49	36@41	45@
Mexican, slab	.....	25@35	.....
Mangabeira, sheet	.....	.....	.....
Guayule	.....	25@35	55@
Balata, sheet	70@71	45@58	62@64
Balata, block	50@51	48@53	.....
AFRICAN.			
Lopori, ball, prime	58@..	45@53	.....
Lopori, strip, prime	.....	.....	.....
Aruwimi	45@47	38@47	.....
Upper Congo, ball red	56@58	.....	.....
Ikelemba	.....	38@45	.....
Sierra Leone, 1st quality	53@54	35@47	.....
Massai, red	.....	40@50	75@85
Soudan Niggers	.....	36@46	36@46
Cameroon, ball	38@43	25@35	.....
Benguela	.....	25@31½	.....
Madagascar, pinky	.....	.....	.....
Accra, flake	.....	22@22½	.....
EAST INDIAN.			
Assam	.....	35@55	.....
Pontianak	6¼@6½	5⅞@ 6½	9@..
Borneo III	.....	20@25	.....
Borneo II	.....	27@29	.....
Borneo II	.....	45@	.....

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows: "Right after my report to you for July, a complete change came over the market for commercial paper, in sympathy with all other financial matters, on account of the war troubles in Europe, and there was almost a complete cessation of business for the first half of August, but during the last half of the month some out of town banks have bought a little of the best rubber paper at 7@8 per cent.—the less known names being neglected entirely."

NEW YORK PRICES FOR JULY (NEW RUBBER).

	1914.	1913.	1912.
Upriver, fine	$0.68@0.75	$0.84@0.92	$1.10@1.19
Upriver, coarse	.40@ .42	.51@ .56	.85@ .91
Islands, fine	.57@ .60	.74@ .81	1.00@1.08
Islands, coarse	.27@ .30	.29@ .34	.54@ .57
Cametá	.30@ .34	.37@ .40	.62@ .65

IMPORTS FROM PARA AT NEW YORK.

[The Figures Indicate Weight in Pounds.]

JULY 27.—By the steamer *Stephen* from Pará and Manáos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss	64,500	5,000	49,200	248,500=	367,200
Meyer & Brown	15,400	1,000	37,600	56,200=	110,200
General Rubber Co.	.....	.....	3,100	.....=	3,100
H. A. Astlett & Co.	.....	.....	23,800	85,000=	108,800
Henderson & Korn	25,400	7,100	30,300	7,000=	69,800
Hagemeyer & Brunn	2,500	1,400	22,400	.....=	26,300
Johnstone, Whitworth & Co.	.....	.....	13,900	.....=	13,900
G. Amsinck & Co.	1,500	.....	1,500	1,600=	4,600
Robinson & Co.	2,400	.....	.....	.....=	2,400
Total	111,700	14,500	181,800	398,300=	706,300

AUGUST 6.—By the steamer *Gregory* from Pará and Manáos:

Arnold & Zeiss	68,700	14,800	44,700	4,200=	132,400
General Rubber Co.	24,400	4,900	6,500	.....=	35,800
Meyer & Brown	29,600	5,600	48,400	23,900=	107,500
Hagemeyer & Brunn	.....	.....	24,400	.....=	24,400
Henderson & Korn	23,300	3,600	24,800	.....=	51,700
H. A. Astlett & Co.	1,100	9,700	9,600	.....=	20,400
Johnstone, Whitworth & Co.	.....	.....	8,600	.....=	8,600
W. R. Grace & Co.	.....	.....	.....	5,700=	5,700
Total	147,100	38,600	167,000	33,800=	386,500

AUGUST 6.—By the steamer *Gregory* from Iquitos:

Meyer & Brown	.....	.....	.....	112,100=	112,100
H. A. Astlett & Co.	1,500	.....	2,600	53,400=	57,500
W. R. Grace & Co.	.....	.....	.....	8,100=	8,100
G. Amsinck & Co.	.....	.....	.....	1,600=	1,600
Total	1,500	.....	2,600	175,200=	179,300

AUGUST 10.—By the steamer *Francis* from Pará and Manáos:

Arnold & Zeiss	126,000	8,100	9,700	21,900=	165,700
Meyer & Brown	5,400	400	7,300	6,200=	19,300
General Rubber Co.	42,100	7,800	7,200	300=	57,400
Henderson & Korn	62,200	11,300	6,000	700=	80,200
H. A. Astlett & Co.	7,100	2,100	39,900	3,000=	52,100
Hagemeyer & Brunn	1,100	700	29,300	1,200=	32,300
Total	243,900	30,400	99,400	33,300=	407,000

PARA RUBBER VIA EUROPE.

		Pounds.
JULY 25.—By the *Baltic*=Liverpool:		
W. R. Grace & Co (Fine..)		1,000
JULY 27.—By the *Carmania*=Liverpool:		
Robinson & Co. (Fine)		4,500
JULY 27.—By the *Commewijne*=Ciudad Bolivar:		
G. Amsinck & Co. (Fine)	2,500	
G. Amsinck & Co. (Coarse)	1,200	3,700
JULY 29.—By the *Maracas*=Ciudad Bolivar:		
General Export & Commission Co. (Fine)	20,000	
General Export & Commission Co. (Coarse)	14,000	
General Export & Commission Co. (Caucho)	1,000	
Schutte, Bunemann & Co. (Fine)	35,000	
Schutte, Bunemann & Co. (Coarse)	2,000	72,000
JULY 30.—By the *Pennsylvania*=Hamburg:		
Rubber & Guayule Agency, Inc. (Fine)	15,000	
Ed. Maurer (Fine)	11,200	
Johnstone, Whitworth & Co. (Coarse)	15,000	41,200
AUGUST 4.—By the *Rochambeau*=Havre:		
Arnold & Zeiss (Fine)		22,500
AUGUST 10.—By the *Maiura*=Ciudad Bolivar:		
General Export & Commission Co. (Fine)	3,000	
G. Amsinck & Co. (Fine)	3,500	
Schutte, Bunemann & Co. (Fine)	4,000	
Schutte, Bunemann & Co. (Coarse)	4,000	
Yglesias, Lobo & Co. (Fine)	6,500	
Yglesias, Lobo & Co. (Coarse)	3,000	24,000
AUGUST 11.—By the *Cedric*=Liverpool:		
Henderson & Korn (Fine)	4,500	
Johnstone, Whitworth & Co. (Caucho)	5,000	
Johnstone, Whitworth & Co., (Coarse)	4,500	
Various (Fine)	3,500	17,500
AUGUST 17.—By the *Bohemia*=Hamburg:		
Rubber & Guayule Agency, Inc. (Fine)		22,500
AUGUST 17.—By the *Laconia*=Liverpool:		
Arnold & Zeiss (Fine)		11,200
AUGUST 22.—By the *Baltic*=Liverpool:		
Johnstone, Whitworth & Co. (Fine)	65,000	
Johnstone, Whitworth & Co. (Coarse)	18,000	83,000
AUGUST 24.—By the *St. Louis*=Liverpool:		
Arnold & Zeiss (Fine)		50,000
AUGUST 24.—By the *Mayaro*=Ciudad Bolivar:		
Yglesias, Lobo & Co. (Fine)		15,000
CENTRALS.		Pounds.
JULY 28.—By the *Panama*=Colon:		
W. R. Grace & Co.		36,000
JULY 29.—By the *Oratavia*=Colon:		
A. Angel & Co.		1,500
JULY 31.—By the *Vandyck*=Bahia:		
Adolph Hirsch & Co.		7,500
AUGUST 3.—By the *Graecia*=Colombia:		
A. Held	4,500	
Caballero & Blanco	2,500	7,000
AUGUST 3.—By the *Allianca*=Colon:		
G. Amsinck & Co.	1,800	
Isaac Brandon & Bros.	200	2,000
AUGUST 5.—By the *Prinz Eitel Frederick*=Colombia:		
G. Amsinck & Co.	1,700	
Andean Trading Co.	800	2,500
AUGUST 10.—By the *Colon*=Colon:		
G. Amsinck & Co.		700
AUGUST 14.—By the *Guantanamo*=Mexico:		
E. Steiger & Co.	10,000	
Harburger & Stack	7,500	
F. W. Dunbar	7,500	
Laurence Johnson & Co.	1,200	
J. Menendez & Co.	300	
I. S. Sembrada & Co.	400	
Lanman & Kemp	700	
General Export & Commission Co.	1,500	
F. W. Burchard	3,500	32,600

AUGUST 18.—By the *Advance*=Colon:

G. Amsinck & Co.	2,600	
I. S. Sembrada & Co.	3,000	
A. M. Capen's Sons	5,000	
W. R. Grace & Co.	1,200	
Andean Trading Co.	4,200	
A. Held	200	
H. Wolff & Co.	1,000	
Piza, Nephews & Co.	2,600	
M. A. De Leon & Co.	10,500	30,300

AUGUST 22.—By the *Panama*=Colon:

G. Amsinck & Co.	5,000	
Isaac Brandon & Bros.	1,200	6,200

AFRICAN.

	POUNDS.	
JULY 23.—By the *President Grant*=Hamburg:		
Arnold & Zeiss	56,000	
Rubber & Guayule Agency, Inc.	25,000	
Ed. Maurer	20,000	
Various	9,000	110,000
JULY 25.—By the *Baltic*=Liverpool:		
Meyer & Brown		11,000
JULY 27.—By the *Carmania*=Liverpool:		
Arnold & Zeiss		7,000
JULY 28.—By the *Zeeland*=Antwerp:		
Various		15,000
JULY 30.—By the *Pennsylvania*=Hamburg:		
Rubber & Guayule Agency, Inc.	9,000	
Various	1,000	10,000
JULY 31.—By the *Adriatic*=Liverpool:		
Arnold & Zeiss		13,500
AUGUST 4.—By the *Vaderland*=Antwerp:		
Various		25,000
AUGUST 5.—By the *President Lincoln*=Hamburg:		
Rubber & Guayule Agency, Inc.	24,000	
Various	16,000	40,000
AUGUST 5.—By the *Olympic*=Southampton:		
Meyer & Brown		60,000
AUGUST 11.—By the *Kroonland*=Antwerp:		
Meyer & Brown	70,000	
Rubber & Guayule Agency, Inc.	17,000	
Rubber Trading Co.	5,000	
Various	8,000	100,000
AUGUST 15.—By the *Celtic*=Liverpool:		
Meyer & Brown		11,200
AUGUST 22.—By the *Baltic*=Liverpool:		
Johnstone, Whitworth & Co.	22,500	
Various	4,500	27,000
AUGUST 24.—By the *St. Louis*=Liverpool:		
Arnold & Zeiss		4,500

EAST INDIAN.

[*Denotes plantation rubber.]

	POUNDS.	
JULY 23.—By the *President Grant*=Hamburg:		
Rubber & Guayule Agency, Inc.	*8,500	
Ed. Maurer	*8,000	
Various	*15,000	*31,500
JULY 23.—By the *St. Louis*=Southampton:		
Meyer & Brown	*9,000	
Ed. Maurer	*45,000	
Rumsey & Greutert Co., Inc.	*17,000	
Earle Bros.	*3,500	
Robinson & Co.	*2,000	
Raw Products Co.	*4,500	
Rubber Trading Co.	*15,000	
Arnold & Zeiss	*40,000	
Johnstone, Whitworth & Co.	*42,000	
Goodyear Tire & Rubber Co.	*67,000	
Various	*42,500	*287,500
JULY 27.—By the *Minnewaska*=London:		
Henderson & Korn	*160,000	
W. R. Grace & Co.	*7,000	
Charles T. Wilson	*60,000	
Meyer & Brown	*4,000	
Johnstone, Whitworth & Co.	*40,000	
W. Stiles	*4,500	
Goodyear Tire & Rubber Co.	*95,000	
Ed. Maurer	*4,500	
Various	*40,000	*415,000
JULY 28.—By the *Zeeland*=Antwerp:		
Meyer & Brown	*25,000	
Various	*115,000	*140,000
JULY 29.—By the *Oceanic*=Southampton:		
Arnold & Zeiss	*6,000	
Ed. Maurer	*3,000	
Various	*15,500	*24,500
JULY 30.—By the *Pennsylvania*=Hamburg:		
Rubber & Guayule Agency, Inc.	*30,000	
Ed. Maurer	*25,000	
Henderson & Korn	*1,000	
Various	*9,000	*65,000
JULY 30.—By the *Chalister*=Singapore:		
Meyer & Brown	*62,000	
The B. F. Goodrich Co.	*150,000	
W. R. Grace & Co.	*5,600	
Arnold & Zeiss	*16,000	
Johnstone, Whitworth & Co.	*25,000	
Ed. Maurer	*80,000	
Henderson & Korn	*75,000	
L. Littlejohn & Co.	*100,000	
Ed. Boustead & Co.	*16,000	
Various	*400,000	*929,600
JULY 31.—By the *Sloterdyk*=Rotterdam:		
Meyer & Brown	*18,000	
Various	*7,000	*25,000
AUGUST 3.—By the *St. Paul*=Southampton:		
Arnold & Zeiss	*33,500	
Various	*85,000	*118,500
AUGUST 3.—By the *Roseric*=Colombo:		
Meyer & Brown	*33,600	
Arnold & Zeiss	*25,000	
Rubber & Guayule Agency, Inc.	*15,000	
Robinson & Co.	*15,000	
Adolph Hirsch & Co.	*15,000	
Johnstone, Whitworth & Co.	*10,000	
Various	*70,000	*183,600
AUGUST 3.—By the *Minnehaha*=London:		
Ed. Boustead & Co.	*15,000	
W. R. Grace & Co.	*14,000	
Charles T. Wilson	*5,500	
Johnstone, Whitworth & Co.	*22,500	
Various	*15,000	*72,000
AUGUST 4.—By the *Vaderland*=Antwerp:		
Meyer & Brown	*100,000	
Various	*40,000	*140,000
AUGUST 5.—By the *President Lincoln*=Hamburg:		
Arnold & Zeiss	*4,500	
Rubber & Guayule Agency, Inc.	*13,500	*18,000
AUGUST 5.—By the *Olympic*=Southampton:		
Meyer & Brown	*6,000	
Rubber Trading Co.	*11,200	
Raw Products Co.	*6,000	
Henderson & Korn	*50,000	
Arnold & Zeiss	*65,000	
Ed. Maurer	*13,500	
Charles T. Wilson	*27,000	
Goodyear Tire & Rubber Co.	*85,000	
Various	*15,000	*278,700
AUGUST 5.—By the *Ockenfels*=Colombo:		
Meyer & Brown	*22,500	
Arnold & Zeiss	*18,000	
Rubber & Guayule Agency, Inc.	*4,500	
W. R. Grace & Co.	*6,000	
Various	*75,000	*126,000
AUGUST 10.—By the *New York*=Southampton:		
Arnold & Zeiss	*82,000	
Henderson & Korn	*18,000	
Ed. Maurer	*35,000	
Goodyear Tire & Rubber Co.	*33,500	
Various	*40,000	*208,500
AUGUST 10.—By the *Minnetonka*=London:		
General Rubber Co.	*140,000	
Henderson & Korn	*46,000	
Charles T. Wilson	*67,000	
Raw Products Co.	*4,500	
Johnstone, Whitworth & Co.	*16,000	
Ed. Maurer	*21,500	*295,000
AUGUST 11.—By the *Kroonland*=Antwerp:		
Meyer & Brown	*200,000	
Arnold & Zeiss	*17,500	
Various	*80,000	*297,500
AUGUST 12.—By the *Indrania*=Singapore:		
The B. F. Goodrich Co.	*150,000	
Arnold & Zeiss	*20,000	
Johnstone, Whitworth & Co.	*40,000	
Manhattan Rubber Mfg. Co.	*500	
Ed. Boustead & Co.	*50,000	
L. Littlejohn & Co.	*95,000	
Ed. Maurer	*85,000	
Various	*295,000	*735,500
AUGUST 13.—By the *Philadelphia*=Southampton:		
Arnold & Zeiss	*140,000	
Johnstone, Whitworth & Co.	*22,500	
Henderson & Korn	*12,500	
Ed. Maurer	*8,000	
Goodyear Tire & Rubber Co.	*25,000	*208,000
AUGUST 17.—By the *Bohemia*=Hamburg:		
Rubber & Guayule Agency, Inc.		*6,000
AUGUST 18.—By the *New Amsterdam*=Rotterdam:		
Manhattan Rubber Mfg. Co.	*8,500	
Robinson & Co.	*2,200	
Rubber Trading Co.	*8,000	
Various	*36,500	*55,200
AUGUST 22.—By the *Baltic*=Liverpool:		
Johnstone, Whitworth & Co.		*30,000
AUGUST 24.—By the *Keelung*=Colombo:		
Meyer & Brown	*50,000	
Rubber & Guayule Agency, Inc.	*30,000	
W. R. Grace & Co.	*10,000	
Arnold & Zeiss	*1,500	
Johnstone, Whitworth & Co.	*20,000	
Ed. Maurer	*12,000	
Robinson & Co.	*17,000	
Henderson & Korn	*50,000	
Various	*20,000	*210,500
AUGUST 24.—By the *Noordam*=Rotterdam:		
Various		*30,000
AUGUST 25.—By the *Minnewaska*=London:		
Johnstone, Whitworth & Co.	*50,000	
Arnold & Zeiss	*35,000	
Michelin Tire Co.	*40,000	
Ed. Boustead & Co.	*15,000	
General Rubber Co.	*2,000	
W. R. Grace & Co.	*2,000	
Charles T. Wilson	*60,000	
Adolph Hirsch & Co.	*8,000	
Ed. Maurer	*3,000	
Various	*190,000	*405,000

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—JULY, 1914.

Imports.	Pounds.	Value.
India rubber	9,511,149	$4,426,121
Balata	55,820	33,430
Gutta percha	111,989	23,730
Gutta jelutong (Pontianak)	1,855,906	77,832
Total	11,534,864	$4,561,113
Exports.		
India rubber	71,181	$31,681
Balata	6,379	3,780
Total	77,560	$34,461
Rubber scrap, imported	1,323,101	$88,404
Rubber scrap, exported	274,118	34,175

BOSTON IMPORTS IN JULY, 1914.

	Pounds.	Value.
Gutta jelutong	507,204	$19,637
Gutta percha	160,345	19,187
India rubber	43,138	22,613

EXPORTS OF INDIA RUBBER AND CAUCHO FROM PARA, MANAOS AND IQUITOS DURING THE MONTH OF JULY, 1914.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	Total.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	Total.	Grand Total.
Zarges, Berringer & Co. *kilograms*	50,284	14,325	81,625	107,367	253,601	81,224	5,072	5,671	38,460	130,427	384,028
Ad. H. Alden, Ltd.	.....	.....	.....	.....	.....	9,431	3,208	10,072	5,458	38,169	38,169
General Rubber Co. of Brazil	21,363	3,264	29,820	51,484	105,931	6,630	170	.....	12,870	19,670	125,601
J. Marques	68,790	22,064	122,607	47,659	261,120	68,340	1,530	5,940	21,280	97,090	358,210
Seligmann & Co.	8,720	.....	4,899	6,409	77,716	10,090	.....	3,418	11,220	24,728	102,444
De Lagotellerie & Co.	.....	.....	.....	.....	.....	2,540	170	900	600	4,210	4,210
Pires Teixeira & Co.	3,740	2,550	83,610	280	92,700	27,370	.....	.....	.....	27,370	120,070
Sundry exporters	5,784	22	2,415	1,534	.....	.....	.....	.....	6,035	6,035	15,840
Itacoatiara, direct	.....	.....	.....	.....	9,805	340	.....	1,310	.....	1,650	1,650
	158,681	42,225	324,976	274,991	800,873	215,965	10,150	27,311	95,923	349,349	1,150,222
Manáos, direct	181,194	23,014	41,129	71,349	316,686	105,402	31,551	31,251	144,886	313,090	629,776
Iquitos, direct	9,653	.....	1,305	74,543	85,501	2,486	500	3,047	230,464	236,497	321,998
Total	349,528	65,239	367,410	420,883	1,203,060	323,853	42,201	61,609	471,273	898,936	2,101,996

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Plantation Rubber from the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to July 20, 1913 and 1914. Compiled by the Ceylon Chamber of Commerce.)

	1913.	1914.
To Great Britain.....*pounds*	5,961,258	8,273,621
To United States	3,511,470	4,615,246
To Belgium	1,649,601	2,686,091
To Australia	294,085	277,456
To Germany	124,449	971,761
To Japan	115,211	199,640
To Italy	36,507	312
To Austria	26,716	—
To Straits Settlements	20,064	40,252
To Holland	992	—
To India	881	550
To Russia	—	98,482
To France	—	205,180
Total	11,741,234	17,368,591

(Same period 1912—5,937,788; same period 1911—2,603,596.)

The export figures of rubber given in the above table include the imports re-exported. (These amount to 2,163,650 pounds—1,784,515 pounds from the Straits and 367,511 pounds from India.) To arrive at the approximate quantity of Ceylon rubber exported to date, deduct the quantity of imports shown in the import table from the total exports.

TOTAL EXPORTS FROM MALAYA.

(From January 1 to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

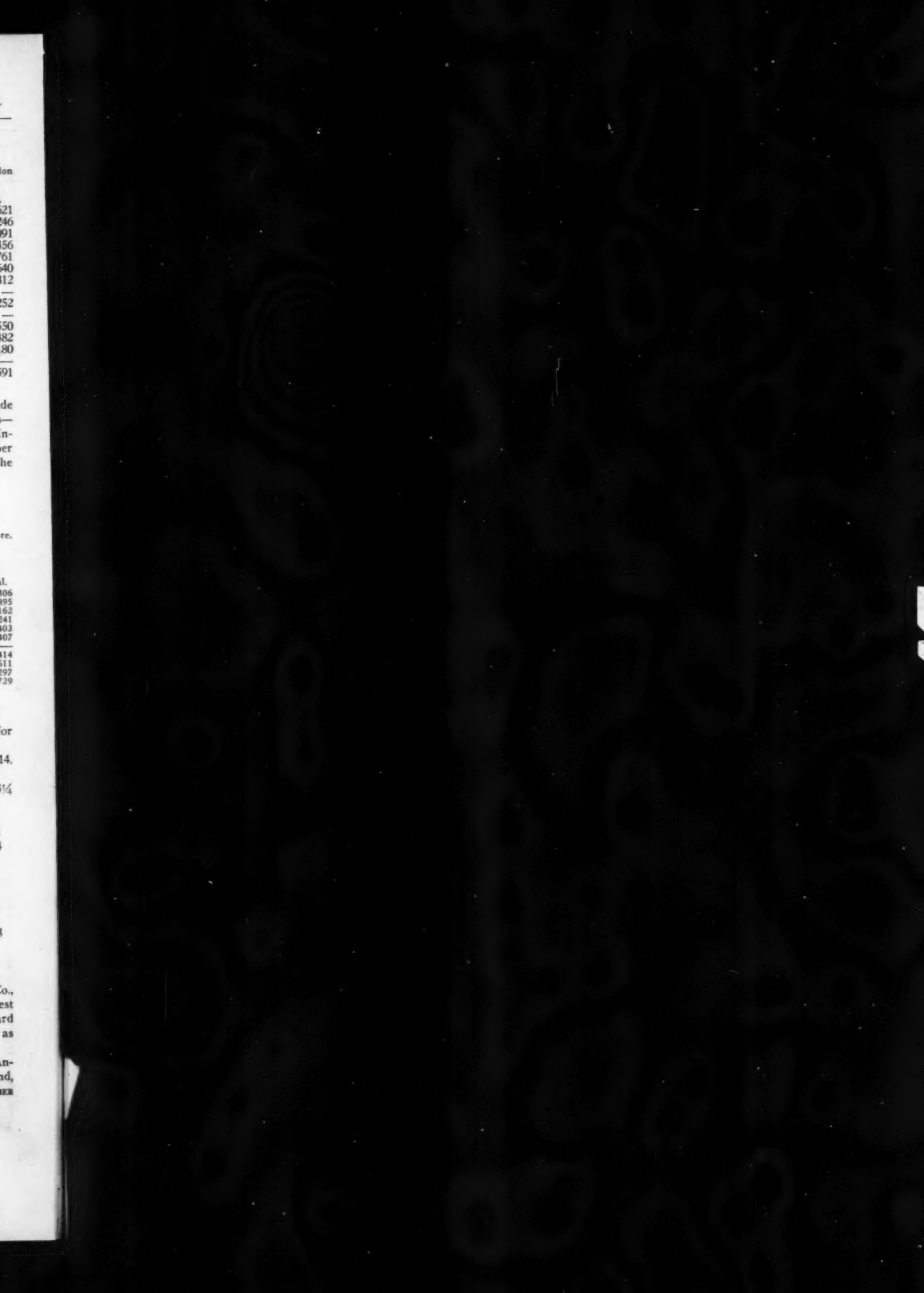
To—	Singapore, July 8.	Malacca, June 30.	Penang, May 31.	Port Swettenham, July 14.	Total.
Great Britain.*pounds*	10,923,091	2,526,558	7,403,600	12,456,057	33,309,306
Continent	1,721,285	22,261	328,933	1,574,416	3,646,895
Japan	594,162	.....	.....	.....	594,162
Ceylon	252,125	.....	467,867	867,249	1,587,241
United States	5,997,680	.....	414,133	136,590	6,548,403
Australia	38,407	.....	.....	.....	38,407
Total, 1914	19,526,750	2,548,819	8,614,533	15,034,312	45,724,414
Total, 1913	12,944,585	.....	5,863,467	14,340,559	33,148,611
Total, 1912	5,911,343	.....	3,211,759	9,998,195	19,121,297
Total, 1911	2,766,372	.....	1,764,641	6,401,716	10,932,729

Rubber Scrap Prices.

LATE NEW YORK QUOTATIONS.—Prices paid by consumers for carload lots, per pound:

	August 29, 1914.
Old rubber boots and shoes—domestic	7 @
Pneumatic bicycle tires	3 @ 3¼
Automobile tires	5 @
Solid rubber wagon and carriage tires	5⅛@
White trimmed rubber	10 @11
Heavy black rubber	3¾@ 4
Air brake hose	3 @
Garden hose	1 @
Fire and large hose	2 @
Matting	¼@
No. 1 white auto tires	5½@
Inner tubes	16 @18

AUSTRALIANS INQUIRE FOR "HUB MARK" LITERATURE.

Mr. Chester J. Pike, Jr., manager of the Hubmark Rubber Co., Boston, Massachusetts, recently received the following request from Sydney, Australia: "Would you be so good as to forward me a copy of your book entitled 'Hub Mark Common Sense' as noted in THE INDIA RUBBER WORLD of April, 1914."

This request proves two things conclusively—first, that the Antipodes are interested in "Hub Mark" literature, and second, that rubber men all round the globe look to THE INDIA RUBBER WORLD to keep them abreast of the times.